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## ORIGINAL ARTICLES

### THE SURGICAL TREATMENT OF CHRONIC ULCER OF THE STOMACH AND DUODENUM\*

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ABOUT the time when my contemporaries and I began to work in surgery, the surgery of the stomach and duodenum was just beginning to become important. The suture of perforating ulcer of the stomach was then of interest and long statistical papers were published collecting the cases here and there. I believe that I had the honor of publishing the first report of a suture of perforating ulcer of the stomach in Boston<sup>1</sup>. All during the intervening years the development of the surgery of chronic ulcer of the stomach has gone on, step by step, starting with crude and unsatisfactory procedures and developing gradually in the direction of accuracy and safety. Every step has been carefully considered and studied. It had to be, for in surgery of chronic ulcer of the stomach there seems to be no half-way method. Either the patient makes a quick and satisfactory recovery or vomits himself to death, or if he lives, is a chronic, half-starved invalid.

The demonstration that chronic ulcer of the stomach would heal after gastroenterostomy, we owe as much to Mayo Robson and Moynihan as to any one else, and in this country the Mayos and the late John C. Munro and others have done much to perfect our methods.

The earlier operators, looking only at the necessity of making an outlet for the stomach contents in pyloric obstruction, began in the easiest way, which, as the anterior surface of the stomach was obviously the most accessible, was by the anterior method. This method necessitated a long loop to be brought up in front of the colon. The long loop was sometimes followed with kinking, twists and obstruction of the descending limb, so that the dreaded vicious circle occasionally resulted. Then it was thought one cause of this condition was due to the fact that the opening was not made in the most dependent part of the stomach, and the posterior opening was made possible by opening through the gastrocolic omentum. The long loop was still employed, however, and still the vicious circle used to result, until it was found that by making an anastomosis between the two limbs of the loop, the bile could be diverted from the stomach and the vicious circle stopped. In

order to avoid the extremely disagreeable necessity of two operations, an enteroenterostomy was combined with the original gastroenterostomy, which made the procedure long and complicated, so that in order to shorten the time, the Murphy button was used, two being employed in each case, as I found the Mayos doing on my first visit to Rochester in 1900. Result—inadequate size of openings and return of symptoms, reoperation, and all the dreary round of trouble that patients often went through in the earlier years.

It was then discovered that by making the opening of the intestine at the very beginning of the jejunum, which lies snugly against the most dependent part of the stomach without tension, kinking or other misplacement, the dreaded vicious circle and other complications might usually be avoided. They were, however, not entirely avoided, and the condition was found to be occasionally due to dropping down of the opening of the omentum across the looped intestine so as to constrict it, or to an actual hernia upward through the opening into the lesser peritoneal cavity. This was avoided by sewing the opening in the omentum up to the stomach well above the anastomosis. Still occasional trouble and the vicious circle continued to result, and we were told I remember by our foreign friends at the International Congress just before the war, that the way to avoid trouble was to make the opening in the stomach as close to the pylorus as possible, so as to have it in line with the progress of the food. This meant a lateral displacement of the opening in the mesocolon and a longer loop of intestine, because the beginning of the jejunum lies in contact with the greater curvature at its most dependent position. Any attempt at distortion or lateral displacement produced deformity, tension and kinking, as was found to our sorrow, so that a return was made to the anastomosis at the most dependent part of the stomach. Is it any wonder that considering the difficulties and unsatisfactory results that were observed, Finney devised his most ingenious method of pyloroplasty, in order to avoid the vicious circle? With all that may be justly said in its favor, the operation is not quite as simple and safe in the hands of most surgeons as the gastroenterostomy with the

\*Read before the Boston Surgical Society, Boston, April 7, 1924.

clamp. Therefore, persistent attention has been given to perfecting the latter operation until it has become very simple and safe indeed, at least in the hands of men who have practiced it.

The essential points in gastro-intestinal surgery which, in comparison with that of other parts of the body, are of greatest importance, are first, avoidance of soiling during the operation, avoidance of tension on the line of sutures subsequent to the operation, avoidance of kinking, and above all, avoidance of hemorrhage. All of these objects are promoted in the highest degree by the most delicate handling of the tissues. I personally believe in the use of clamps, because so much soiling is avoided, and the accurate apposition of the tissues is made so much simpler and easier, for in this way we are not bothered by a flood of blood during the operation and the necessity of placing ties. The one danger of the clamp, that of secondary hemorrhage after the operation, may be avoided only by the most careful and accurate placing of every suture, and I think that the continuous Connell suture is the thing to use. Dr. Scudder taught us something of the importance of careful and accurate suturing. If we want to have a gastroenterostomy leak, a good way to produce the result is to use coarse sutures threaded in the needle so as to make a shoulder; then every time you take a stitch you jerk it through, traumatise the tissues, make a large hole, and actually destroy the holding place for your stitch. That is the reason that fine silk and linen sutures were used, so that we began to have the subsequent invalidism created by gastro-jejunal ulcer, and contraction of the openings, due to the persistent presence of a nonabsorbable infected suture acting as a foreign body. A definite reason against the use of too fine sutures is that they have to be placed very close together so as to tend to strangulate the edge, and also that by their use the time of the operation is prolonged. I have found that the long straight round needle, hollow at the end, with the end of the coarse No. 2 chromic suture introduced into it, is of the greatest help in the world. The suture is absorbable, is coarse enough to be strong and get a good hold in the tissue and does not absorb too soon. The stitches, if accurately placed, do not have to be so close together as to strangulate the edge, and the thread follows the needle through without the slightest hitch. If the coarse thread is used and the stitches accurately placed, there is no need of three layers of suture on the posterior side of the anastomosis, and I have not had a hemorrhage from the suture line for many years. As the tissues are held in the clamps an over-and-over suture of the posterior layer is efficient if the sutures are placed with care, and the double cross shoemaker stitch of Crile is not necessary. On the anterior layer I believe it much better to turn in the edges by the in, out

and over stitch, than not to do so. Always take off the clamps before finishing the first layer of sutures, so as to see if there is hemorrhage, which seldom occurs but it is best to be sure. The escape of contents of stomach or bowel may be prevented by having the assistant lift up the ends of the first layer of suture the posterior having been placed first of all. There is a great difference in patients in regard to the ease of performing a large, adequate, efficient gastroenterostomy. If the patient is thin, the stomach hangs low, is movable, the operation is easy. But if, as is sometimes the case, the stomach is high up under the ribs and the mesentery is loaded with fat, it may be difficult. Do not forget that much may be often gained by carrying the incision clear up to the xiphoid. Also, if the mesocolon, which you have to tear through, is loaded with fat, so that the blood vessels are hidden, never cut through it, but tear through it with the greatest care, as injury to the loop of the colica media may prove to be annoying and even serious. The opening should always be as close to the root of the mesentery and as far from the colon as possible, and exactly in the centre of the circle made by the arterial loop. In order to get the opening in the stomach large enough to take two fingers, the incision should be two and one-half inches long and should run from above downward on the stomach, the lower end being clear to the greater curvature and slightly to the left of the upper end. This will carry the direction of the loop to the left in the natural course of the jejunum and avoid twisting. On finishing the operation, one suture should be placed to stitch the posterior border of the loop of the jejunum to the mesentery, to avoid a transverse hernia of the small intestine across this opening, which occurred in one of my cases more than a year after the gastroenterostomy, and required an emergency operation.

Another reason, in addition to the inadequacy of technique, for the poor results which we used to get in the early days of gastric surgery, was first that the operation was sometimes done in cases where it was not required, and in fact was more than useless. Ulcers were at the pylorus, were suspected that did not exist due to tension on the stomach when lifted up by the hand. The diagnosis of stricture was sometimes made where it did not exist, and the patient's symptoms were attributed to ulcers which, while they were not demonstrable, the surgeon thought must be present. Gastroenterostomy was proposed for persistent vomiting from every cause, no matter how remote from ulcer of the duodenum. Now, in fact, we have come gradually to realize that, in ulcer of the duodenum at least, vomiting is a rare and unimportant symptom. The confusion resulting from imperfect understanding did much to discredit the operation and to raise doubt in the minds of the profession regarding the whole subject. Sec-

ondary operations were often done for division of the pylorus in persistent vomiting after the primary operation, and were sometimes successful. Secondary operations, however, are often difficult on account of the adhesions caused by the primary operation, and the second operation produces more adhesions than the first and so on with the third and fourth. Nowadays, with modern, careful, perfected technique, secondary operations are very rarely required. Again I would like to emphasize the importance of delicate handling of the tissues, care and accuracy in placing sutures, and avoidance of tension. If your sutures, clamps, assistants, etc., are in good order, one ought to get through these operations under forty-five minutes, without haste and disconcertion. Hasty operating, resulting in puncture of veins with the needle, tearing of the tissues, irregular tension on the stitches, is the worst thing one can do. If you think you must get through in half an hour and hurry in order to do so, you are apt to need an hour and a quarter or an hour and a half to correct your mistakes and have your patient in a much worse condition than if you have deliberately tried to work slowly, considering the ease and accuracy of every step and doing it as it ought to be done. If one tries to go slowly, one ought to get through in forty-five minutes at the outside.

The turning in or excision of an ulcer at the duodenum may be done if the ulcer is on the anterior surface and not too large. I did it for several years. It is, however, unnecessary, and even slight procedures, if unnecessary, should not be done. The excision of an ulcer at the duodenum without a gastroenterostomy should never be done, as we merely substitute for the ulcer a suture line without changing the abnormal conditions. The food goes over the same route. The chemistry is the same and the conditions which produced the ulcer are unchanged. What these conditions are, except for the hyperacidity, we do not definitely know. But we do know that after gastroenterostomy the majority of the patients begin to improve from the 24th hour after operation, lose their hyperacidity and often show several pounds gain in weight in the ten days or two weeks that they are in the hospital. Whether excision of the ulcer combined with a Finney is better than gastroenterostomy in small accessible ulcers of the duodenum, I do not know. In case of hemorrhage, in these cases, it is our best resource. The indurated ulcer extending far down on to the duodenum and adherent to the pancreas, is certainly impossible for me to excise with safety, and these are the very cases which do best after a properly performed gastroenterostomy.

The question of resection of the ulcer-bearing area of the pylorus and duodenum whenever possible is a mooted one. In ulcers of the duodenum, even if the risk is only slightly increased, I consider it inadvisable because there

is no danger of cancer. Ulcers in the pyloric side of the stomach are supposed to carry potential danger of carcinomatous degeneration. For this opinion the great authority of the Mayos is largely responsible. From my own experience, I do not fear it, and although once in my life I resected a small cancer at the pylorus which was supposed to be an ulcer, I have lost one or two patients by resecting ulcers, whom I have reason to believe would have been alive and well if I had confined my efforts to a gastroenterostomy. Gastric ulcers close to the pylorus have healed after gastroenterostomy just as well as duodenal ulcers. Cancer has never in my experience developed in the site of a primary ulcer. I am unwilling to take a risk, however slight, to avoid a danger so problematical.

One case in which I lost a patient by doing too much, after a very satisfactory excision of the pylorus for ulcer, died on the tenth day apparently from embolism, caused the conviction that if I had done less he might be alive and supporting his large family. In two instances in the hands of my colleagues, when I should have confidently expected a duodenal ulcer to heal with gastroenterostomy, excision was done and skilfully done, but both patients died.

The operative risk of an ulcer is I believe a little greater, and the risk of cancer, from which one may try to protect one's patient, is not worth it. We get away successfully with many extensive resections for cancer, but here there is no question that the risk is more than justified. A chronic ulcer at the pylorus, if it has not already developed cancer, will heal after a gastroenterostomy, and therefore will not develop cancer. If it has developed cancer, you will generally know it by the time the patient comes to you for operation.

With ulcers on the lesser curvature, the case is different. They are not so apt to be benefited by drainage of the stomach and therefore by gastroenterostomy as is the case with ulcers at the pylorus. Their excision is bloody and difficult, and was often fatal in my hands. The procedure of Balfour in these cases has been of the greatest value. Clear the omentum off the surface, burn the ulcer out with a cautery, invert and suture, perform gastroenterostomy. Do not try to excise the ulcer by carrying the cautery out into the healthy stomach surrounding the ulcer. The large veins in this region will bleed just as badly when cut across by the cautery as by the knife. It is enough to destroy with the cautery the area which is actually ulcerated. The gastroenterostomy is just as important as any other part of the procedure, for you have got to get rid of the hyperacidity and change the chemical conditions. Often the easiest thing to do in these cases is the sleeve excision of the ulcer-bearing area. This I have done and with success, but I do not believe in leaving a circular band of scar tissue around the stomach, and I

have known hour-glass contraction to follow the operation. The results of the Balfour operation are in the main good and therefore I prefer it.

The above remarks apply to the general run of cases of ulcer of the stomach as they come to the surgeon, and apply even to cases which are accompanied by hemorrhage, if the hemorrhage is so moderate in degree as to be merely an incident in the course of the disease. If the hemorrhage is severe and the patient very anaemic, transfusion is of course one great recourse, followed I believe as soon as may be by operation, and here an essential point of the operation is the burning out of the ulcer by the actual cautery, followed by suture in such a way as to get the big blood vessels leading into the ulcer into the stitches. It is here not a good plan, as stated above, to burn too far into the healthy tissues in attempting complete excision, an attempt which I have seen result fatally.

There can be no doubt that in many clinics throughout the world there is a tendency to more frequent performance of resections both in ulcers of the pylorus and the duodenum. Also, perhaps that one of the various resections is being more frequently done in ulcers of the lesser curvature. It was interesting to read Mayo's extremely interesting paper of April, 1923<sup>2</sup>, and note his discussion. He believes that he secures 90% of cures of duodenal ulcer by gastroenterostomy, and that the use of the Finney pyloroplasty will add another 5%. In smaller ulcers on the lesser curvature, Balfour's operation, (cautery and gastroenterostomy,) will cure 90%.

Extensive ulcers of the pylorus are according to him best treated with excision by the Billroth 1 or 2, or Polya-Balfour method. Balfour himself credits his own method in small ulcers of the lesser curvature, with 2.12% mortality and 85% cure. Large ulcers, on account of danger of malignancy, require partial resection. This danger seems very small, since in 418 cautery incisions for ulcer, and this including the inaccessible and the earlier cases, only 1.9 subsequently died of carcinoma.

Deaver's reported position on the subject is curious. In large duodenal ulcers when the bowel wall is infiltrated, he does a pylorotomy, just the ones where, except in hemorrhage, I should avoid it. He also does gastroenterostomy alone for large ulcers involving much of lesser curvature and posterior wall with extensive adhesions. This is surely conservative. No statement is made from the other large clinics indicating that anything short of resection is done in such cases.

Moynihan does many resections for pyloric ulcers and ulcers of the lesser curvature. In duodenal ulcer he is apparently more radical than he has formerly been. According to Dr. Hodgson's excellent review of the subject in

the BOSTON MEDICAL AND SURGICAL JOURNAL<sup>3</sup>, the radical surgery is being done on ulcer of the stomach and duodenum on a larger scale in central Europe than elsewhere.

Haberer, for instance, believes in the radical removal of all ulcers, even the most adherent, and usually does the Billroth No. 1. And so with others.

To return to my own position, there is no doubt, as Mayo says, that the field for partial gastrectomy is greater in ulcers of the stomach than in the duodenum, and I do not see how we can avoid excising these deep ulcers of the lesser curvature that slowly perforate and bleed. But as the cases are presented to me, the ulcers at the pylorus or just on the gastric side behave as well after gastroenterostomy as those of the duodenum. If resection in such cases is easy and safe, I have no quarrel therewith. However, at my clinic at the City Hospital, I have a lot of bad risks, and I think "safety first" is just as good a slogan in the abdomen as on the street. And another thing, each case must be treated on its merits, and the decision as to procedure in a given case cannot be made till surgical exposure makes accurate examination of the lesion possible. It's a good rule that when you cannot draw the stomach pretty well outside the abdomen, you cannot safely resect. That's why I don't resect extensive indurated ulcers going well down on to the duodenum.

I find that in the last fifty-four gastroenterostomies which I have done for duodenal and pyloric ulcer there were three deaths or 5.5%. All the deaths were in cases operated upon in the City Hospital. One was in a man of sixty-six with an extensive duodenal ulcer, who had bleeding for weeks before he was operated upon. The ulcer was very extensive, and the hemorrhage was not stopped by gastroenterostomy and transfusion. One patient had had years of ineffectual dietetic treatment and a bad heart. He developed no abdominal symptoms. His pulse went to pieces, however, and he died two days after the operation. The third case died of general peritonitis. He may, of course, have developed a leak. He is the only patient in many years who has been suspected of having had that happen to him after a gastroenterostomy for ulcer in my hands. I have had no vicious circles for years. I am aware that the mortality of 5.5% in gastroenterostomies is higher than in many clinics. Considering the conditions of neglect, starvation and complication with other troubles we get at a municipal clinic, however, I do not consider it a bad showing. In a patient in fair condition, without increased hemorrhage, an ordinary case of ulcer of the duodenum, I have no fear of operative mortality.

Under medical treatment, the breadwinner of a family is often compelled to live in a hospital

<sup>2</sup>Boston Medical and Surgical Journal, Vol. 190, No. 4, April 3, 1924, p. 592.



on a special diet for weeks or months. On improving and getting out, he usually breaks over and relapses. With adequate operative drainage, however, he is able within two weeks after operation to eat enough to improve in weight and color, and in a month or so go back to work.

I have no statistics as to the ultimate results, but such of my friends and private patients as I have been able to follow have shown satisfactory results. The ability to enjoy life and food and drink makes the difference between their condition before and after operation, and a great difference it is.

A few historical facts are interesting: The first successful operation on this continent was done by Dr. Atherton of Frederikton and the record may be found in the *New York Medical Record* in 1895. The first reports of operation in cases of perforating ulcers began to be published in 1893 in the *London Lancet*, the oldest one on my list is in the *Lancet*, Vol. 1, p. 4, 1893.

#### REFERENCES

- 1 Boston Medical and Surgical Journal, January 11, 1900, Vol. CXLII, No. 2.
- 2 Surgery, Gynecology and Obstetrics, April, 1922.

### HELIO THERAPY\*

BY R. PLATO SCHWARTZ, M. D.

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SINCE 1903 heliotherapy has acquired an important place in the history of medicine. For twenty-one years it has been used in the treatment of tuberculosis, and at present it survives many so-called "cures," announced during that period, chief among which tuberculin and surgery hold most prominent places. The beneficial effects of sunlight upon the human body are empirically established, but its therapeutic application has been extended to include chronic diseases other than tuberculosis, and it is now accepted as an effective prophylactic agent. The damaging enthusiasm and exaggerated statements which at first prevailed have, at least in part, been succeeded by an earnest desire to learn the truth about heliotherapy; all patients do not recover, and certain limitations must, therefore, be recognized. Although sunlight is not equally effective for all patients, its use, under widely varying climatic conditions, has defined definite advantages over other forms of therapy which makes it a therapeutic agent of first consideration in the treatment of osteo-articular tuberculosis.

Bernhard<sup>1</sup>, of Samaden, began exposing the patient's affected extremities to sunlight in 1902. The following year, Rollier at Leysin, advocated and practiced the treatment of extrapulmonary tuberculosis by systematically graduating the exposure of the whole cutaneous surface to the sun's rays. Sir Henry Gauvain, at Alton, England, the late Dr. John H. Pryor of Buffalo, Dr. Clarence Hyde of Akron, Ohio, and Dr. Horace Lo Grasso of Perysburg, N. Y., were first in demonstrating that heliotherapy could be successfully used in England and the United States. The prophylactic value and therapeutic indications for systematic, graduated exposures of the entire body surface to sunlight in the mountains, on the plains, and at the sea shore has become well established.

The quantity, intensity, and frequency of dosage is of importance here as in other forms of therapy. The rays of the solar spectrum are usually considered as the therapeutic agent which should be carefully administered, but it must be remembered that complete rest in bed, good food, fresh air baths, and orthopedic care are important adjuvants which assist in producing the beneficial reactions obtained. Although many methods of administration have been tried, Rollier's original technique has been most successful.

It is usually best for the patient to become accustomed to the full exposure of the body to air baths in the shade before insolation is begun. This requires moderate weather and occasionally considerable tact on the part of both physician and nurse to convince some patients that any benefit is to be derived from such an unconventional procedure. According to Rollier's plan the body is divided into five zones. The first includes the feet to just above the ankles; the second extends from the ankles to the knees; the third from the knees to the hips; the fourth zone includes the abdomen, while the fifth extends from the xiphoid process to the chin, thus including the thorax and upper extremities.

On the first day at 8:00 A. M. the patient is placed in the sun, in such position as will provide adequate protection from the prevailing winds. Only the first zone is exposed on the ventral surface for two and one-half minutes, then, if the general condition of the patient and the location of the lesion permits, the dorsal surface is exposed for an additional two and one-half minutes. At 3:00 P. M. this exposure is repeated, giving a total of five minutes' exposure on the first zone on the first day.

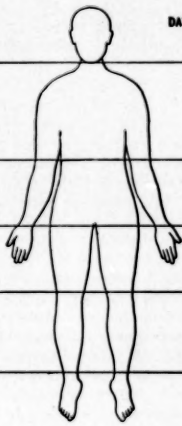
On the second day the exposure to the first zone is repeated and at the close of the two and one-half minute period, the cover is removed from above the ankles to above the knees, the second zone is thereby added to the first and

\*Read before the New England Pediatric Society, Friday March 14, 1924.

the ventral exposure is continued for an additional two and one-half minutes. The dorsal surface should be similarly exposed if possible but the danger of burning does not justify increasing the ventral exposure. On the second day, therefore, the first zone receives at 8:00 A. M. a five minute exposure on the ventral surface, while the second zone receives a two and one-half minute exposure over the corresponding area. The total exposure for the second day on the first zone is ten minutes on the ventral surface and ten minutes on the dorsal surface, while the second zone receives a total of five minutes' exposure on each of these respective surfaces. On the following days each successive zone is exposed in this gradual man-

definite amount of favorable progress, beyond which they fail to advance. A third group is most refractory, and more or less completely fails to respond to any and all efforts made to check the disease.

For the most part the location of the lesion has not been observed to influence the extent, duration and time of exposure, but the character of the local process may justify a certain modification of the above procedure. The presence of one or more sinuses, with secondary infection, multiple lesions, and pulmonary or renal involvement usually accompanies a general condition which requires caution with exposure until a considerable increase in diffuse pigmentation has been obtained. It should usually

DR. ROLLIER'S SCHEMATIC DIAGRAM OF INSOLATION	DAYS										
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
						5 Min.	10 Min.	15 Min.	20 Min.	25 Min.	30 Min.
				5 Min.	10 Min.	15 Min.	20 Min.	25 Min.	30 Min.	35 Min.	
			5 Min.	10 Min.	15 Min.	20 Min.	25 Min.	30 Min.	35 Min.	40 Min.	
		5 Min.	10 Min.	15 Min.	20 Min.	25 Min.	30 Min.	35 Min.	40 Min.	45 Min.	
	5 Min.	10 Min.	15 Min.	20 Min.	25 Min.	30 Min.	35 Min.	40 Min.	45 Min.	50 Min.	
<p>From the 10th to the 15th day, increase according to the same scale.</p> <p>From the 15th day, all the previously exposed portions of the body should receive the same amount of insolation as the longest exposed part, — increasing the time 5 minutes daily, till a bath of from 3 to 4 hours is taken.</p>											

THE PROGRESSION BY WHICH THE PATIENT IS EXPOSED TO THE SUN

FIG. 1.

ner until the patient receives a maximum of one and one-half hours in the morning and one and one-half hours in the afternoon, a total of three hours a day.

Patients with osteo-articular tuberculosis, treated according to the above method, may be divided into three groups on a basis of their systemic reaction. Improvement in the first three months is usually characterized by better appetite and diminished pain and digestive disorders, more restful sleep, and a definite increase in weight, with the degree of these indications of improvement usually proportional to the depth of pigmentation. A second group of cases is characterized by a relatively slow deposition of pigment, with a corresponding delay in the development of the usual evidences of improvement; although they frequently make a

be looked upon as unwise to permit any patient to receive a total exposure of more than three hours a day even after pigmentation has reached its full depth.

The justification for all this is found in certain facts which have for some time been a part of common knowledge. It is generally admitted that most persons past forty years of age have at some time in their lives been affected by tuberculosis and recovered from it without ever having been aware of its presence. This offers pretty strong evidence to the effect that the human body is provided with a defensive mechanism protecting it against tuberculosis. Extra-pulmonary lesions and osteo-articular tuberculosis, in particular, have for several years been regarded as secondary manifestations of this disease. It seems apparent, therefore, that pa-

tients with such lesions should be looked upon as systemically tuberculous; and with this admission there is revealed the fallacy of attempting to cure tuberculosis in a patient by concentrating therapeutic measures upon the secondary lesion in an affected extremity. Is it not possible that the discouraging results of the past were in a large measure due to this form of treatment, and that the more favorable results of heliotherapy follow the general stimulation of the defensive mechanism previously referred to?

The results obtained at the J. N. Adam Memorial Hospital are essentially in accord with



FIG. 2.

those reported by Rollier, Reyn, and Sir Henry Gauvain\*. Of the 1,105 patients with tuberculosis of the spine treated at Alton, England, since the opening of the institution, 96.8% were discharged at the completion of treatment with the disease arrested; of the 1,042 patients with tuberculosis of the hip 97.8% were arrested; of 432 patients with tuberculosis of the knee 98.0% were arrested; of 65 patients with multiple tuberculosis 93.0% were arrested; of 364 other tuberculous lesions 98.3% were discharged arrested. The total mortality, resulting chiefly from tuberculous meningitis, was less than 2%. Zahradnický<sup>1</sup> observed 5,175 cases of "surgical tuberculosis" over a period of twenty-five years. He states that recovery was complete in 57.7%; partial in 36.7%, and 4% of the patients died. He uses both conservative and radical measures in combination with general

treatment, including heliotherapy. The question may be asked as to what part the sun plays in relation to fresh air baths, good food, rest in bed, and proper orthopedic treatment. These must all be regarded as essential, but certain well established facts lead to the belief that the solar spectrum plays a very important role.

The visible portion of the solar spectrum varies in wave length from 3,900 Å. U. at the violet end, to 8,000 Å. U. at the red end. Ritter<sup>1</sup> in 1803 revealed the presence of chemically active rays beyond the violet end of the visible spectrum. He demonstrated that this region was even more effective than the visible blue and violet in producing the reduction of silver chloride, and applied the term ultra-violet to this region of the solar spectrum. It is now known that the earth's atmosphere transmits ultra-violet down to 2,950 Å. U. but high altitudes and clear atmosphere are necessary to obtain these shorter wave lengths in any appreciable quantity. Artificial lights, however, such as the carbon arc, the mercury arc, etc., radiate a relatively large amount of light of much shorter wave length than 2,950 Å. U. which is the limit of the solar spectrum reaching the earth's surface. The presence of light beyond the red end of the solar spectrum was first discovered by Sir William Herschel in 1800. This region, the so-called infra-red portion of the solar spectrum, extends out to about 50,000 Å. U. but becomes very weak beyond 25,000 Å. U. Artificial light sources such as incandescent solids, etc., radiate infra-red beyond 3,000,000 Å. U. but for practical purposes, at least so far as therapy is concerned, 30,000 to 40,000 Å. U. may be considered the effective limit of the infra-red spectrum. Some idea of the above spectral limits and the distribution of intensity throughout the spectrum may be obtained from the solar radiation curves here given.\* The upper curve represents sunlight just outside the earth's atmosphere, the lower curve represents sunlight as it reaches the earth's surface at 10:30 A. M., average treatment hour, on a clear summer day at Perrysburg. The upper curve is from the combined work of Professor C. G. Abbot, of the Smithsonian Astro-Physical Observatory, and the staff at Mount Wilson. The lower curve is an average from summer observations, by Dr. Brian O'Brien, at Perrysburg. The difference between the two curves is due to atmospheric absorption, for even on an apparently cloudless day a large portion of sunlight is absorbed in passing down through the earth's atmosphere.

In this connection it is well to mention that ordinary window glass although very transparent throughout the visible spectrum, near visible ultra-violet, and near visible infra-red, becomes quite opaque to ultra-violet of shorter

\*The above curves were constructed by Dr. Brian O'Brien, Research Physicist for the Buffalo Tuberculosis Association, stationed at the J. N. Adam Hospital through the efforts of the late Dr. John H. Prior.

wave length than about 3,200 A. U., and is also quite opaque to infra-red of longer wave length than about 28,000 A. U. In winter the almost continuous absence of the sun and the obliquity of its rays tend to retard the progress of treatment. The use of sun-baths in closed rooms behind ordinary window glass is unsatisfactory, the ultra-violet is absorbed and its effect is therefore lost, while the stimulation which usually accompanies fresh air baths is greatly diminished. The interruption of treatment because of inclement weather has probably

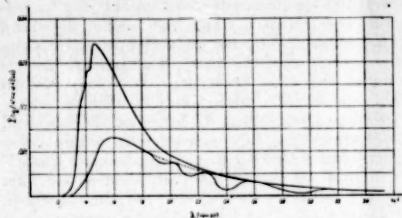


FIG. 3.

The upper curve represents sunlight just outside the earth's atmosphere. (From the combined work of C. G. Abbot, Smithsonian Astro. Phys. Observ. and Staff at Mt. Wilson Observ.) The lower curve represents sunlight at 16:30 A. M. at Perryburg. (The average of summer observations by O'Brien.)

been best obviated at the Finsen Institute in Copenhagen.

The untimely death of Dr. Finsen in 1904 was a great loss to those deeply interested in the application of light in the treatment of disease. He fully appreciated and advocated the general exposure of the body to sunlight but it was almost continuously absent at Copenhagen and he attempted to devise an artificial source of light which could be substituted for the sun.

The Finsen-Reyn' apparatus "utilizes the positive crater of the carbon arc and is made in two sizes, one for the treatment of four patients simultaneously, while with the other only one patient can be treated at a time. The rays are concentrated by convergent quartz lenses, which do not absorb the ultra-violet." The peculiar advantage of the rays from the carbon arc lies in the fact that the spectral distribution and intensity approach that of the solar spectrum plus the addition of ultra-violet of considerably shorter wave length than that which will pass through the earth's atmosphere under the most favorable conditions.

The mercury vapor lamps are particularly rich in ultra-violet but very deficient in the visible portion of the spectrum, and infra-red is practically absent. The effect of the violet and ultra-violet rays is very pronounced and definitely beneficial when properly applied in conjunction with the other portions of the solar spectrum and under the stimulation which fresh air, rest, and good food furnishes the human body. It is believed, however, that lamps which give

off essentially ultra-violet rays cannot be expected to fulfill heliotherapeutic requirements. Unfortunately advertisements are already attempting to convince us that the mere possession of such a lamp will give a title to the results obtained in the Swiss Alps.



FIG. 4.

The excellent results reported reveal the possibilities of heliotherapy at relatively low altitudes, and so far as Perryburg is concerned, an artificial source of light has not been used to any appreciable extent during the past two years. Both the mercury vapor lamps and the ordinary carbon arcs failed to give sufficiently good results to justify continuing their use. The results reported by Ernst<sup>2</sup> from the Finsen Institute were obtained entirely by the use of artificial light and in some respects are better than those reported by Rollier<sup>3</sup> who is admitted to have almost ideal conditions. Even the Swiss Alps have some periods of cloudy weather and a proper source of artificial light seems to be indicated in institutions where conditions are most favorable for administering heliotherapy.

The literature is filled with refutation as to the biological effects of the various regions of the solar spectrum. There is no doubt that living tissue may be seriously affected by light, while heat as a participating factor is definitely eliminated. Likewise the red end of the spectrum may produce injurious effects when, by filtration or the character of the source of light, the intensity of the blue and ultra-violet rays has been reduced far below that which is normally tolerated without harm. The ultra-violet region is, however, undoubtedly responsible for the initial erythema and subsequent pigmentation which usually results when normal human skin is gradually exposed to sunlight. If the duration of the exposure exceeds the individual tolerance for the stimulus received a certain amount of tissue injury may follow, sunburn and the subsequent peeling of the skin is typical of a mild degree of cellular destruction. Ogneff<sup>4</sup> has shown that moderate exposure results in mitotic cell division, but if the length of exposure is too great necrosis follows. Blue rays have only a slight cytotoxic effect, and the various



regions toward the red end of the spectrum are without a demonstrable specific action.

Certain patients are extremely sensitive to the effects of ultra-violet, notably the red haired Irish type which burns very easily and freckles instead of taking on the usual diffuse pigmentation. Hausmann<sup>8</sup> has shown that certain pigments in the blood, hematoporphyrin for example, make animals so sensitive that a few minutes exposure to light proves fatal. Sellards<sup>9</sup> has demonstrated that artificial fluorescent substances may also increase the sensitivity of tissues to light, while Bovie<sup>10</sup> states that the proper exposure of proteins to ultra-violet rays of sufficient intensity will result in their coagulation. The conclusions of these men may in some measure explain why some individuals actually suffer from only a brief general exposure to sunlight.

Finsen believed that the striking benefits obtained by treating tuberculous lesions with sunlight and the carbon arc light resulted from a stimulus of sufficient degree to increase the circulation in the skin and subcutaneous structures, without inducing a true solar erythema. Rollier<sup>12</sup> believes that a strong erythema should be avoided, Reyn<sup>13</sup> of the Finsen Institute does not agree with this view; he produces a strong erythema at the beginning, by giving an initial general exposure of thirty to forty minutes duration, using the "positive crater of the carbon arc" and eliminating the effect of the heat rays by placing a layer of distilled water between some of the lenses."

Regardless of the degree of erythema which should be produced by the initial exposure to either sunlight or the carbon arc the fact remains that the blood supply is increased throughout the entire cutaneous and subcutaneous area of the body. Active and repeated stimulation of such an extensive area is probably responsible, to a large extent, for the remarkable changes which take place.

It is well known that the effect of certain toxins in vitro is modified by heat, and it is believed that a general rise in temperature may have a similar effect upon toxins within the body. Sonne's<sup>14</sup> work leads him to the conclusion that the curative effect of the universal light bath is due to the capacity of the luminous rays, during the light bath, to heat a very essential portion of the blood volume of the organism to a temperature possibly exceeding the highest ever measured fever temperature without causing the body temperature to rise to any appreciable degree. He<sup>15</sup> has shown that white guinea-pigs subcutaneously injected with diphtheria toxin, and then light treated for two hours on the shaved backs with visible light rays, endured the toxin much better than guinea-pigs not light treated after the injection with toxin. Hansen<sup>16</sup> believes that this increase in cutaneous and subcutaneous tissue temperature accounts for the fact that rabbits receiving the light bath



FIG. 5.

endured the injection of killed typhoid bacilli much better than the controls. He is also convinced that the universal light bath definitely influenced the amount of typhoid agglutinins in the blood.

The application of heliotherapy invariably produces a rapid improvement in the general condition of the patients suffering from osteo-articular tuberculosis, although the local manifestations of the disease may remain stationary, or may reveal subjective symptoms and physical signs of regression. This apparent reversal of the local condition usually does not justify anxiety and should be met by the application of fundamental orthopedic measures, indicated for the relief of pain and muscle spasm, the prevention and correction of deformity, and the restoration of function. The necessity for exposure of the entire body to sunlight and fresh air has resulted in the modification of conventional apparatus used in the treatment of orthopedic cases.

Plaster jackets are never used for tuberculosis of the spine, plaster spicas are not applied to tuberculous hips, and the leg is never encased in plaster for tuberculosis of the knee or ankle. Affected joints are kept immobilized in the line of deformity during the entire period of acute inflammation, then the extremity is gradually freed from fixation and the patient is taught first to contract the muscles surrounding the articulation without inducing motion. If he withstands this without the recurrence of the slightest subjective symptoms or physical signs in the joint he is urged to execute a few degrees of motion, and subsequent progress is determined by the local reaction. Very definite evidence has been provided which justifies the belief that long continued immobilization, as it was used in the surgical treatment of tuberculous joints, was in a large measure responsible for the loss of function which so frequently occurred.

The experiments of Legg<sup>17</sup> in 1908 caused him to conclude that the atrophy was as great in the immobilized extremities of animals with normal joints as it was in the extremities of animals which had undergone joint infection and immobilization. Allison and Brooks<sup>18</sup> have

called attention to the fact that a certain amount of atrophy results from the simple confinement of the patient in bed. It seems from the evidence presented that the degree of atrophic degeneration of specialized structures is undoubtedly greater in the average hospital than in those institutions which are equipped to administer heliotherapy. Charcot<sup>20</sup> believed it was apparently demonstrated that muscular alterations which result from nerve-irritation supervene with much greater rapidity, and are preceded and accompanied by more or less marked modifications of electrical contractility, which do not show themselves with the same characteristics when they result from functional inertia, and then only make their appearance at the end of a very long lapse of time. If the abolition of function by simple rest in bed produces atrophy, it seems reasonable to conclude that an extremity, held motionless in a plaster cast for months at a time, would undergo changes of the same character but much more severe in degree. It is possible that the failure in the restoration of function in the tuberculous joints has in the past been due to,—

1. The destructive character of the disease, which reached wide limits because it was opposed only by the unstimulated defensive mechanism.

2. The long continued application of plaster and similar apparatus resulted in such complete atrophic degeneration of specialized structures that ankylosis was necessarily a desirable outcome.

3. The absence of therapeutic measures which were effective in overcoming the systemic infection while the local lesion apparently recovered, not only favored recurrence but predisposed the patient to more severe manifestations of the disease elsewhere.

As previously stated, the true indications for surgical procedures will always exist, only our interpretations may change as truth is made more evident. Aspiration or incision through healthy tissue for the drainage of an abscess is indicated to prevent sinus formation. Once formed, all sinuses and ulcers should not be closed by firm bandages. To cork up a sinus in this manner seems wrong. This opinion is based upon the observation of sinuses exposed to the open air and diffuse light for twelve hours a day; pus is freely discharged, the surrounding skin remains healthy, and ulcers at the mouth of the sinus are less frequent. Arthrodesis of a joint is to be advised when deformity, instability or both make the extremity a liability instead of an asset. Other indications may prevail, but it must always be held in mind that surgical measures alone are not likely to benefit, and may seriously impair the patient's general condition.

These considerations may seem of only theoretical interest but actual experience appears to reveal a practical value which is definitely tangible. Patients with a tuberculous bone or joint,

systematically treated according to the above outline, are greatly improved in general health, while the extremity frequently regains useful function within eighteen months to two years, when ankylosis in a favorable position was the best the past could offer.

#### CONCLUSIONS

1. Thirty-three years have not produced universal confidence in the use of tuberculin in the treatment of any form of tuberculosis.

2. Heliotherapy has clinically proven the indications for its use on the basis of the general changes in the patient, the prevention of deformity, and the restoration of function in the affected joint, providing that fundamental orthopedic requirements are met.

3. High altitudes have a certain advantage but excellent results are being obtained at the sea shore; at either level clean clear air is a necessity.

4. Systematic, graduated exposure of the entire body, except the head, with careful observation of each patient as the period and extent of insulation is increased, seem to be of fundamental importance in any serious attempt at heliotherapy.

5. Clinical observations and laboratory investigations, at present, favor the opinion that the therapeutic value of the solar spectrum is not due to the effect of any one region; but is more the result of the combined effect of the entire spectrum.

6. Artificial sources of light are to be regarded with suspicion until it is proven that they reproduce the solar spectrum in extent and intensity.

7. The local lesion in the bone or joint should be completely immobilized during the acute stage, apparatus is indicated but should not interfere with insolation. Sinuses and ulcers should be unbanded twelve hours each day and subsequent treatment should favor the restoration of function.

8. Surgery must be looked upon as occasionally essential in the conservative attitude toward treatment of osteo-articular tuberculosis, but to use it wisely requires a knowledge of when conservative measures have reached their full potentiality in each individual case.

The writer wishes to thank Dr. Brian O'Brien for certain data on the physics of light, contained in this paper.

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## THE PREVENTION OF TUBERCULOSIS\*

BY WILLIAM P. BUFFUM, JR., M. D., PROVIDENCE

THE subject of the prevention of tuberculosis is a very large one. It is also an exceedingly difficult subject to write on because the main facts are not known. The sources of infection, the modes of infection, the factors which give resistance to the disease, are, after all, not well understood. In some instances we think that we understood the course of events, in more instances we know that we do not. Is adult infection generally a newly acquired disease, or is it an extension of hilum tuberculosis of childhood? When adult infection takes place, is it by inhalation, ingestion or from the throat by other channels? What is the main factor and what are the minor factors in causing the remarkable decrease in the death rate from tuberculosis in the United States during the last twenty-five years? My connection with tuberculosis work has been very slight, and I am not qualified to judge in these matters, but it seems to me that these questions, and most others in connection with the epidemiology of tuberculosis, cannot be definitely answered at the present time. In view of this situation, and also that the time allotted to me is short, I shall make only a few remarks on the prevention of tuberculosis in general, and then describe briefly the Lakeside Preventorium.

The decline in the tuberculosis death rate in the United States during the last twenty-five years has been truly remarkable. In 1900 for the registration states, this death rate was 195 per hundred thousand inhabitants. Twenty-one years later for the same area it was 94 per hundred thousand.† In twenty-one years the number of deaths had diminished to less than one-half of the original number. In the fifth year of the Framingham demonstration the tuberculosis death rate showed a reduction of 67% over that of the decade before this experiment.‡

A good deal of stress has been laid on inherited resistance to tuberculosis, and there certainly is a great variation in susceptibility to tuberculosis between different families and different races.

\*Read before the New England Pediatric Society at Boston, March 14, 1924.

†Dublin, Louis I.: *The Causes for the Recent Decline in Tuberculosis*. Transactions of the 19th annual meeting of the National Tuberculosis Association.

‡Armstrong, Donald B.: *Indications from the Experience of the Framingham Tuberculosis Experiment*. Boston Medical and Surgical Journal, March 29, 1923.

There has been a feeling that in view of this variation, the decline in the incidence of tuberculosis might be due largely to the natural processes of evolution changing the resistance to the disease. It seems evident, however, considering the rapid reduction in tuberculosis in Framingham during the demonstration, and in the whole country during twenty-one years, that evolution must be indeed a minor factor in this reaction.

It seems plausible that the decline in tuberculosis death rate, in the above mentioned instances, is largely directly due to the tuberculosis program. In fact the Framingham demonstration seems to definitely prove that the measures employed caused a marked improvement in the situation. Unless a number of diseased persons escaped to other parts without their absence being noted, this demonstration seems conclusive. One part of the antituberculosis program, the sanatorium treatment of the sick, gives a definite result in regard to the effect on the patients. Dublin has calculated by estimating the expectation of life for tuberculosis patients of the different grades of severity inside the sanatoria and at home, that 6,000 lives are saved yearly by this treatment.\* As regards other forms of antituberculosis activity, although they may be apparently useful, the situation is complicated by different factors and the degree of usefulness of a particular measure cannot be definitely estimated.

A greater factor in the general reduction in tuberculosis in the United States than any yet mentioned might be the improved economic status of the individual. The effect of wealth on the liability to tuberculosis is well known. Although innumerable figures could be produced in this connection, I shall quote only one authority, Dr. Jacques Bertillon, in his annual report on the vital statistics for the City of Paris. In 1907 he carefully figured out the death rate from tuberculosis in each of the twenty wards of Paris and sums up his statistics partly as follows: "In each age group the rule is the same; the more wealthy the ward is, the less tuberculosis is found; the poorer the ward is, the more frequent is tuberculosis. The differences are so marked that the incidence of tuberculosis is at least four times as great in the

\*Dublin, Louis I.: As above.

poorest ward as it is in the most wealthy." In the years 1901-1905 the death rate in the wealthiest ward was about 105, which is close to the rate for the United States at present. In the same period the rate for the poorest ward was about 525. The statistics show no decline in tuberculosis during ten years but this is partly due to a slight change in classification and there is in reality a slight fall. The results from the antituberculosis program in Paris up to the year 1905 were not as striking as those in this country have been.

After this general discussion I shall now take up briefly certain phases of the subject as it applies to preventorium treatment of children. I shall not discuss the problem of the prevention of tuberculosis in infancy. The high mortality in clinical tuberculosis at this age, and the low incidence of infection as shown by the Von Pirquet test, would seem to indicate that the elimination, as far as possible, of exposure to infection was the end to work for, especially in respect to the first year of life.

After the period of infancy a very high degree of resistance to tuberculosis is developed. In Providence in 1922 the number of deaths among children in the first five years of life recorded as due to tuberculosis was twenty-three, while in the ten year period between five and fifteen years of age it was only eight. Thus the death rate from tuberculosis among these children is very low. The occurrence of obvious clinical tuberculosis, aside from the cervical gland cases, is comparatively uncommon. Dr. Morse has reported that in the Children's Hospital in Boston in 1921, the diagnosis of tuberculosis in any form formed only 1% of the diagnoses in the medical O. P. D. and only 4% of the diagnoses in the medical wards.

On the other hand, infection with the tubercle bacillus is evidently very high. In the Framingham experiment it was found that the Von Pirquet test was positive in 54% of the six year old children. At the preventorium, where our children average about 5 years old, we obtained 26% positive among the children not considered to be especially exposed to tuberculosis, and 69% positive among the children who had been reported to be exposed in their own homes.

The proportion of cases of clinical hilum tuberculosis that can be demonstrated among these children is a matter of which I have no definite knowledge, and I hope that when I read this paper Dr. Chadwick will have made that clear to us. It has been reported that tuberculosis can be demonstrated in as high a number as 8% of all malnourished children. My own personal experience in trying to diagnose hilum tuberculosis has been so brief that I cannot give any figures on that point.

The preventorium idea is based on the assumption that a good percentage of the cases of adult tuberculosis is due to the juvenile type of infection, which has been latent in childhood, and

later has in the adult spread and caused the pulmonary type of disease. It is, I believe, the opinion of the majority of tuberculosis experts that this extension is the cause of the greater part of adult tuberculosis, and that fresh infection occurring during adult life is a less common occurrence.

The preventorium is planned to take children who are supposedly infected with tuberculosis, and whose general physical condition and nutrition cannot be kept in a satisfactory state at home. By improving their physical condition it is hoped to lessen their liability to adult tuberculosis. Whether the preventorium is worth while or not depends chiefly on the answer to two questions.

1. How much of its purpose does it accomplish?

2. How much does it cost?

Let me finish my paper by describing briefly the Lakeside Preventorium at Hoxsie.

The Lakeside Preventorium, financed and managed by the Providence Tuberculosis League, was founded in 1912. It is located at Hoxsie, in the town of Warwick, R. I., eight miles to the south-west of Providence, two miles from Narragansett Bay and twenty miles from the ocean. It is on the edge of a lake, and on elevated ground, dry and sandy, with many oak trees which cast sufficient shade in summer. A large natural sand pile makes a good playground for the children, and the lake has a good bathing beach which is in frequent use.

The buildings used for preventorium purposes are three in number. The main building, sometimes called "The Home," is used from October to June. This is a large, square house of twenty-four rooms. There is a large porch on the south side, and we expect to soon build a second story porch that will be partly glassed in as a protection against extreme weather.

The second building is the "Bungalow." This is used as the preventorium from June to October. It has wide sleeping porches, and the children sleep out of doors on these porches during the time in which this building is in use.

The third building is the "Play House." This in reality is but a wooden shed, 18 by 60 feet, with no wall on the south side. This is situated on the slope of a sandy hill and here the school is held, and we have found it warm enough to be used with comfort except for the three coldest days this winter.

The staff consists of the following: The director, Miss Murray, is a registered nurse of wide experience with tuberculosis problems. Her office is at the offices of the Tuberculosis League. As attending physician I examine all applicants for admission, and visit the preventorium once a week. In residence are a graduate head nurse and two assistant nurses, three employees for general housework, and the farmer.

I have always considered that one of our chief causes for pride has been the results obtained



when compared with our money outlay. If all the expenses of running the institution are added up, including even insurance on buildings, but not including the original cost of land and buildings, the maintenance cost per week per child is \$4.99. This low figure is made possible partly by the preventorium farm which provides much of the food, and partly by the summer vacation periods of two weeks each during which as many as 150 mothers and children are cared for on the same premises and share the expense.

The most important group of patients is composed of children supposedly infected with tuberculosis, and whose state of malnutrition is a source of danger. This is the group for which the preventorium was originally founded and it is the treatment of these which seems the most important. The undernourished children, especially those who have been subjected at home to repeated infection with tuberculosis, would be expected to fill some of the beds at the State sanatorium in later years. In bringing them back to a state of good nutrition and strength their prospects are improved.

Another group, similar in appearance and in reaction to treatment, is the simple malnutrition group. When for reasons of extreme poverty or bad home conditions a malnourished child does not do well at home, he is admitted to the Preventorium. Some children from better homes are admitted and usually do very well, presumably because of improved hygienic conditions and general regulation of dietary and health habits.

Another group, consisting of cases of rickets, has, as would be expected, shown excellent results. The combination of good food, plenty of sunlight, with some medical and orthopedic supervision, has caused an improvement in many cases that is truly remarkable. Other types of patients are accepted if there is room, and if it seems probable that the out-door treatment will benefit them. We have at present a small group of children with chronic cardiac disease, several of whom have recurrent arthritis. We have had single cases of many different types of disease.

Our total cases for 1923 may be grouped as follows:—

Malnourished and exposed to tuberculosis.....	59
Malnourished with no known exposure .....	61
Convalescents from various diseases .....	26
Cardiac cases .....	5
Rickets .....	5
Tuberculous cervical glands .....	3

During 1923, fifty-nine of our patients formed the group of malnourished children, either of tuberculous parentage or else otherwise subjected to contact with active pulmonary tuberculosis. The physical examination of the chest varied considerably according to the examiner. My examination of these 59 children showed nothing definitely abnormal except as follows—

one child, Leo, showed considerable dullness between the scapulae, some rales, and a positive D'Espine sign. The X-Ray was reported very suspicious and Von Pirquet positive. This child is now at the State Sanatorium and is doing well. This seems to be a case of hilum tuberculosis with some parenchymal involvement. Another child, Rita, had a positive Von Pirquet, and some dullness between the scapulae. The X-Ray showed enlargement of the bronchial root glands and peribronchial infiltration. Three other cases could probably be called hilum tuberculosis. The rest of the children in this group gave essentially negative physical examinations. D'Espine's sign was usually negative. From the above observations it would seem that it is rather uncommon to find obvious physical signs of tuberculosis among children under twelve, even among a group selected in part by tuberculosis workers drawn from twenty-six malnutrition classes, two large hospitals and the private patients of many physicians in a large community.

A group of 14 malnourished children at the Preventorium recently were selected to note the deficiency in height. Of these children 11 were under 5 years and 3 between 5 and 10 years. They remained at the Preventorium an average stay of 9 weeks. In general appearance they were markedly malnourished and considerably underweight for their height. The total gain in weight for 9 weeks was 77 pounds, or an average of 2½ pounds a month. The striking fact about these children was the deficiency in height. The average height for these children figured out accurately from the age height-weight card as furnished by the State Child Welfare Dept. should have been approximately thirty-eight inches. Their actual height averaged thirty-three inches; the height of the children was on the average approximately five inches less than it should have been. Their average growth was 2.2 inches in nine weeks, a gain about six times as great as is normally expected in that period.

Another characteristic of these children has been their mental backwardness or abnormality. They are usually dull, and in school stand below the normal standards for their respective ages. The mental response to improved living conditions is as marked as the physical, and it is nearly the usual thing for a child on returning from Lakeside to go into the class ahead of the children that were formerly with him.

#### TREATMENT

The first step in treatment has been the making of arrangements for any special procedures that are indicated, such as removal of tonsils and adenoids, treatment of the teeth, examination of eyes, and so forth. The methods of treatment are naturally of the simplest. We have not sufficient nursing force, equipment, or funds to undertake any procedure that does not

promise considerable benefit. The children have a simple diet of cereal, bread and butter, meat, vegetables, fruit, and a quart of milk a day. They have a good sleep at night and a rest period of one hour or more after the 12 o'clock dinner. They are out of doors day and night in summer, and during the winter average six hours out of doors unless it is stormy. During about six months in the year the clothing consists of trunks or bloomers with shoulder straps and no sleeves. Thus the legs, arms, shoulders, and neck are bare, presenting a considerable surface to the sun. During the winter they wear underclothes, dresses or suits, stockings and shoes. They wear sweaters out of doors if it is cold.

We have not attempted any more exposure to the sun than is noted above, for several reasons. In the first place, any systematic heliotherapy would require considerable oversight, and our nursing staff would have to be increased. In the second place, our children are with us only a short time, an average of nine weeks, and there is a constant supply of new patients arriving. It would seem that under these circumstances the objections of the mothers to this form of treatment might be a good deal of a handicap to us. Our chief reason, however, for keeping our children clothed as they have been is that they have done so well that we have not felt compelled to make any change.

Tuberculin treatment has not been given. We have not considered it to be indicated for the type of case usually seen at Lakeside. Practically the only medication given has been cod liver oil, and this has been used in the presence of rickets or when the child has not been doing as well as we thought he should.

There is one characteristic of the Preventorium that has, we believe, a beneficial effect on the children, and that deserves special mention. Due to the wise management of the Director, the atmosphere of the place is pleasant. The nurses and employees are happy and enthusiastic and treat the children with affection. Also the children are left as far as possible to amuse themselves in their own way without unnecessary orders or rules. In general the patients are very happy under these circumstances, and it is unusual to find an unhappy child at Lakeside.

In immediate effect on the nutrition of our patients, the results of the Preventorium have been very striking. The children who were pale and listless have usually become ruddy and bright. The total weight gained will serve as an indication of the improvement. The total number of children discharged in 1923 was 142. The average stay of 122 of these was 9 weeks. The total gain in weight was 560 pounds. The average gain was one half a pound per week per child. The other 20 children stayed only a few days.

In respect to ultimate results in the prevention of adult tuberculosis, we have as yet no figures. On the other hand the preventorium has been in existence for twelve years. A good proportion of our cases have been followed up by the tuberculosis nurses, clinics and other agencies reporting to the Tuberculosis League, and it seems that our children do well.

In closing I should state that I have not discussed the nutrition classes and other parts of the anti-tuberculosis program which deal with children, as time would not permit.

## THE EVOLUTION OF JUVENILE TUBERCULOSIS\*

BY HENRY D. CHADWICK, M. D.

TUBERCULOSIS in children between the ages of five and twelve is essentially a disease of the lymphoid tissue. In order to understand the course of tuberculosis at this age period, it is necessary therefore to have a clear idea of the lymphatic system in the thorax and its relation to the pulmonary tissue.

In the lungs we have a superficial and a deep set of lymphatics—the superficial supplying the pleura and the deep set forming a network that accompanies the blood vessels and bronchi in their subdivisions throughout the pulmonary tissue. The two systems are connected and their afferent trunks converge in the lymph nodes of the hilum. The mucous membrane of the lungs is in direct contact with the outside world through the inspired air. Any bacteria that may reach the air cells in this way may be conveyed into

the lymph spaces. The lymph stream then carries them to the tracheo bronchial nodes. All the drainage from the lungs must pass through these nodes. Furthermore, the thoracic ducts, which convey the lymph collected from the cervical region and intestinal tract, empty into the sub-clavian veins. The pulmonary artery distributes it through the capillary system of the lungs. While making this circuit any bacilli that may be in the blood have an opportunity to pass through the vascular wall into the lymph spaces and then they are carried by the lymphatics into the tracheo bronchial nodes. The lungs, therefore, are the filters for the bacteria taken into the body by inhalation and by ingestion, and all the lymph filtered out of the lungs is passed through the tracheo bronchial nodes. These glands, therefore, are the receiving stations for the tubercle bacilli regardless of where they have gained entrance into the body.

\*Read before the New England Pediatric Society, March 14, 1924.

We know that nearly all children are ultimately infected with tubercle bacilli. The place to look for any disease produced by this infection is in the lymphoid tissue about the trachea and larger bronchi. The primary lesion may be elsewhere. Pathologists often find small isolated tubercles in the lungs of children but the clinician can seldom demonstrate such lesions by the most thorough physical examination. The infected hilum nodes draining the lobule of the lung in which there is such a focus of disease reacts most intensively to the infection. We should, therefore, fix our attention on the hilum, as in childhood tubercle selects this lymphoid tissue for its development. Krause found clumps of bacilli in the tracheo bronchial node of a guinea pig within four hours following injection of bacilli into a vein. Baldwin and Gardner in some inhalation experiments demonstrated that lymphatic node tubercle may become visible earlier than that in the lungs. When large numbers of bacilli reach the lungs either by inhalation or through the vascular system, the lymphatics are incapable of carrying them all away and a local lesion in the pulmonary tissue develops. With children, if a tubercle develops in this way, it is usually so small that no symptoms are produced and its presence cannot be detected by examination. The tracheo bronchial nodes draining that area become diseased and constitutional symptoms are present. Only when this group of glands are extensively involved are there any symptoms. This early stage of tuberculosis is one that is best defined by the term of bronchial adenitis.

#### SYMPTOMS

The most common symptom is fatigue. A chronically tired child without apparent cause is one to be suspected of having this hidden focus of tuberculosis. Such a child is usually underweight or fails to gain in a normal way. Lack of appetite and listlessness are common with these children. Another group show extreme nervous irritability and restlessness. Physical signs may be negative but frequently there will be found interseapula dullness which may be demonstrated with careful technic. If the D'Espine sign is present, it is corroborative evidence, but I do not consider its absence of any significance.

The X-Ray film is very valuable in demonstrating enlarged bronchial glands. Interpretation of the film should be done by an experienced physician, who is not only familiar with chest films in general but with films of children's lungs in particular. He should also have a clinical background and the interpretation should not be independent of careful consideration of the history, symptoms and physical examination. This latter should be inclusive of the whole respiratory tract. The bronchial group of glands may be enlarged from so many

must be made by elimination. Therefore, an X-Ray interpretation made by reading a film without other considerations is of little value in these cases. Furthermore, before a definite diagnosis of tuberculous bronchial adenitis is made, a positive tuberculin test by the intracutaneous method should be obtained. One tenth of a c.c. of a dilution of tuberculin 1 to 10,000 should be given. If this is not positive, one tenth of a c.c. dilution 1 to 1,000 should be next tried. If this is not positive, then try one tenth of a c.c. of a dilution 1 to 100. Not infrequently, the second or third test with the increased amount of tuberculin will be positive. If we are content with the first dilution, an error in diagnosis will occasionally be made.

#### HILUM TUBERCULOSIS

The next step in the progress of juvenile tuberculosis, after the tracheo bronchial glands have become diseased, is to involve more of the pulmonary bronchial group at the root of the lung and peri-bronchial tuberculosis develops. The symptoms are similar to the ones noted in bronchial adenitis—more constitutional than local. Cough may be present intermittently, simulating transitory colds. This is due to the pressure of the gland masses on the bronchi rather than to bronchitis. The cough is dry and unproductive. Local sweating is a common symptom. Not the night sweats of phthisis but excessive perspiration such as is found in debilitated persons. The temperature is usually normal with occasional exacerbations of fever following fatigue or unusual exertion. The temperature may then range from 99.6 to 100 for a few days but rest will soon bring it to normal. These symptoms are due to the reaction or sensitization of the tissues of the body to the products of the tubercle bacillus.

The physical signs in these cases show marked interseapula dullness and this dullness often extends to the supra-spinus fossae. This dullness is not due to tuberculous infection of the apex but is caused by a reflex spasm of the underlying muscles. No impaired resonance is found anteriorly at the apex in these cases although rarely it may be found at the right of the sternum. When this is found, however, the X-Ray film will be needed to determine whether this dull area is due to the right border of the heart or to infiltration of the tissues of the mediastinum. No abnormal signs will be found on auscultation in these cases as the perenchyma of the lung is not involved except sometimes the deeper tissues near the lung root. The X-Ray film will show masses irregular in outline and varying in density at the hila extending outward into the lung. Linear nodular shadows will be seen extending upward and outward into the lung at the second and third interspaces. As to whether these linear shadows are due to peri-bronchial tuberculosis or are due to congestion

other causes than tuberculosis that the diagnosis of the vascular system surrounding the bronchi, is a debatable question. However, we know the lymphatic tissue is in close contact with the smaller bronchi at their bifurcations. If the lymph ducts are blocked by diseased hilum nodes, the channels become engorged, stasis occurs and a back pressure results that may convey tubercle bacilli into the periphery of the lung. This may also prevent drainage from the lung of tubercle bacilli that may reach the parenchymatous tissue by the blood stream or by inhalation at a later date. We then may have a re-infection from without instead of one by direct extension from an already active lesion.

The X-Ray film often reveals the first visible focus of pulmonary tuberculosis in the second interspace when no signs have been found on physical examination. We frequently fail to discover the focus of disease in this location by auscultation and percussion. Not until it has extended and involved the apex do we often find rales and changes in resonance. One reason for this is we are apt to pay more attention in our examination to the supra-clavicular space than to the infra-clavicular area. Again, the pectoral muscles make slight changes more difficult to detect. I have often seen evidence of the spreading of hilum tuberculosis to the periphery in children who have been under my care first with the hilum type of tuberculosis and then at a later date were found to have lesions in the middle lobe or in the second and third interspaces and involving the apex.

The transition from hilum tuberculosis to pulmonary or adult type takes place in three different ways. The most common form is direct extension outward into the pulmonary tissue. This may take place in either lobe, more commonly the middle or upper lobe on the right side; or the middle or upper part of the upper lobe of the left lung. The involvement seems to follow the larger bronchi extending to the lobes. Extension to the base is not uncommon in children. The second and less usual form is to find a general dissemination of tubercle involving both lungs. This must be caused by a caseous focus in some lymph node discharging bacilli in

large numbers into a vein, and they are then carried by the pulmonary artery to all parts of the lung. The result is many small areas of tubercle, all of similar density, scattered throughout the lungs. The appearance of an X-Ray film in a case of this character is that of a general tuberculosis and the areas of infiltration are of varying size with a tendency to coalesce in many places.

Third: Bacilli may be aspirated from a caseous node into a bronchus and so infect a new area. The whole section of lung tributary to this bronchus may be thus involved and a condition of tuberculous pneumonia develop as a result of the massive infection.

The prognosis of bronchial adenitis and hilum tuberculosis is excellent, provided good hygienic measures can be carried out over a sufficient period of time. When the hilum type changes to the adult form in a child and tubercle bacilli are found in the sputum, a fatal termination almost invariably follows. This course is more rapid in the disseminated type. In the fibroid type, although the course is chronic in character, the result is the same as in the cases with positive sputum. The prognosis of the cases of the adult type of tuberculosis in children being so very bad, it is the more essential that we find the cases when the disease is confined to the glands. Then arrest can be expected in nearly every case. Hilum tuberculosis is a comparatively benign affection. Pulmonary tuberculosis in children is a malignant disease. The prevention of this condition should be the purpose of every physician. It can be done if we keep in mind the fact that incipient tuberculosis is a disease of the lymphoid tissue at the root of the lung and not a disease of the parenchyma itself. The air cells not being involved, rales will not be heard. We should direct our attention to the root of the lung in children and to the apices in adults. We should be willing to make a diagnosis of tuberculosis in children on symptoms, plus signs of infiltration at the root of the lung, plus X-Ray evidence of enlarged tracheo bronchial glands, plus a positive intracutaneous tuberculin test and the exclusion of any other condition that might produce similar signs and symptoms.

## OCULAR FACTS FOR THE GENERAL PRACTITIONER\*

BY HOLBROOK LOWELL, M. D.

"There is nothing new under the sun" we are told and you will find that the following remarks cover old ground. The excuse for them, if an excuse is necessary, is that they are stimulated by a sincere desire to aid "the other fellow," be he layman or physician. All teachers and students agree that only by repetition

and presentation of facts in various ways may every type of mind be permanently impressed.

Much has been written about the eye in its relation to general diseases. The busy internist or general surgeon knows and admits the value of ocular abnormalities in diagnosis. Many practitioners in large communities avail themselves of these valuable, diagnostic data. In suburbs and country districts the ocular find-

\*Read before the Middlesex East District Medical Society, May 14, 1924.



ings are not as often sought. Too often for his own good, the patient takes things into his own hands and goes to some refractionist because his doctor did not suggest whom to consult. Under these circumstances no adequate report may be made to the doctor, there is no co-operation for the best interests of the patient, possibly sight is impaired or lost, and life may be shortened.

The only organ in the human body with transparent tissues is the eye. Through these tissues may be seen the live blood coursing through the blood vessels and also "the secret processes of diseases and repair." Here we may see, in the deeper parts, hemorrhages and exudates appear and disappear, and disease of the blood vessels in every stage of degeneration. Often the first evidence of nephritis, diabetes, cerebral neoplasm and grave nerve disease is here noted.

The optic nerve, the largest but one of the twelve cranial nerves and so short that it is considered an off shoot of the brain, ends in the posterior part of the eye and is seen on end, as a flat, rounded, white disk. This is the only nerve that can be seen in the human body, without dissection. Here is the barometer that may register the degree and fluctuations of intra cranial pressure due to tumor or abscess, meningitis and other inflammatory conditions and also pressure after fracture of the skull. During the late war general surgeons found it greatly to their advantage to consult the ophthalmic surgeons as to the ocular findings and their interpretations before operating on head injuries.

In this brief enumeration of ocular manifestations in general diseases the parietic and paralytic muscle changes must not be overlooked. One of the most recently realized diagnostic phenomena is seen in encephalitis lethargica. This condition is often first suspected because of ocular muscle abnormalities. Muscle abnormalities may often be seen in sequella of syphilis, fracture of the skull and diphtheria.

Chronic glaucoma, unlike the foregoing conditions, is primarily an eye disease, the most frequent and insidious of the blinding eye diseases, and is the most often the cause of total blindness after middle life. It may, however, occur early in life, as evidenced by a case seventeen years of age operated upon by the writer in 1922. In its early stages even the trained ophthalmologist may fail to recognize this condition. In a recent paper Wells' writes, "The universal failure of opticians and refractionists to recognize early glaucoma is a sufficient reason for discouraging patients from consulting such people for glasses, as rapid change in refraction is often one of the early symptoms."

As evidence of the necessity of a thorough ophthalmic examination, followed by a concise and not too technical report sent to the physician referring the patient, the following occurrences are noted.

Case number one—a poor cigar maker came

to the office complaining of poor sight. He had been fitted to glasses by a refractionist and then had had several other pairs of glasses tried, spending some two or three months and considerable money trying to get vision. It was a marked case of nephritis in the last stages. He died in eight weeks.

Case number two—came in with an inflamed eye. He had been treated by a "refractionist" and had paid him one hundred dollars in fees for visits. The trouble was found to be a foreign body imbedded in the cornea. Fortunately ulceration did not follow and the patient was well the next day.

Case number three—the sister of a doctor, had had numerous glasses given her for failing vision. Examination showed a long standing case of chronic glaucoma. An operation stopped the process, holding the little vision she had left.

Case number four—came in complaining of double vision of sudden onset, and headache. He had never had any eye trouble before. Muscle imbalance was found. A diagnosis of encephalitis lethargica was made. The patient went home to another state and was seen by several doctors there who did not agree with the diagnosis and sent him to one of Boston's large hospitals where the original diagnosis was confirmed.

Case number five—came in to the office with the history of steady loss of vision for several months. She had been in the hands of a "refractionist" during that period, who, she said, had "changed and changed" her glasses. Examination revealed a choked disc of two or three diopters, indicating brain pressure, probably a tumor of some sort.

Case number six—came to the office with a marked nephritis picture in the fundi. The patient's physician was telephoned to and the seriousness of the condition pointed out. The reply was, "O, I think you are an alarmist. There isn't much the matter with him." The patient had a high blood pressure but the doctor had not seen fit even to test the urine, but gave the patient some "pills." Later a consultant was called who confirmed the grave ophthalmological findings and said that not much could be done. The patient died in a few weeks.

Case number seven—the patient of a well trained general practitioner, showed marked Argyle Robertson pupils, pale discs, and the patella reflexes were absent. A report was made to the doctor who vociferously scouted the idea of any trouble being present which could cause such symptoms.

Look back at the few examples cited and figure out for yourself the cost of unskilled work. Why should not the patient pay a comparatively small fee for a competent consultation? The average consultant is connected with some hospital where he may refer cases for care at small expense, if the case required special care, or to

his clinic if the patient is totally without means.

A few days ago a patient came in who had lived in Russia until he came to this country, fifteen years ago. He was able to count fingers at about three feet and vision was unimproved by glasses. Marked changes were seen in the retina and the whole picture suggested a syphilitic origin. He was able to afford only a small fee and could not afford a Wassermann and the other tests, so he was referred to the hospital clinic to be thoroughly gone over. He had no family physician to whom he could be referred back. Not much can be done for this long standing condition but one has the satisfaction of knowing that all is being done that is possible and that a patient with ample means could get no better attention.

What is the matter with so many of us? Is our education so hurried and forced that we fail to avail ourselves of skilled methods of diagnosis, and do not protect our patients and the public from getting into the hands of the unskilled? Truly the old adage holds good, "an ounce of prevention is worth a pound of cure." Of course the cost of special attention is said to be one of the chief reasons for unskilled work. The general practitioner tries to make it as easy as possible for his patient, financially, and often fails to realize that one patient sent to the unskilled is like a pebble thrown into a pond; the ripple of his thoughtless advice reaches many others.

#### REFERENCE

- 1 Wells, David W.: *The Diagnosis of Glaucoma*. Boston Medical and Surgical Journal, Vol. 196, No. 8, pp. 282-283, Feb. 21, 1924.

#### BOOK REVIEWS

*Geriatrics*. By MALFORD W. THEWLIS, M. D., with Introductions by A. JACOBI and I. L. NASCHER. Second Edition. C. V. Mosby Company, St. Louis, 1924. Pages 401.

That there should be demand for a second edition of this presentation of the subject of Geriatrics, is proof of a healthy interest in the problem of the optimum care of the elderly.

The book itself, of almost four hundred pages, somehow gives an impression of excessive length in proportion to the total value of the subject matter between its covers; yet, on careful review one finds here and there true nuggets of wisdom, experience, or common sense. Unfortunately, these nuggets are too often immersed in such a dull dross of neo-antiquity, as to raise the shadow of a doubt if after all one may not be perusing some skillfully constructed prospectus of a distributor perhaps for electro-therapeutic apparatus, or possibly for such of our newer therapeutic agencies as renal extract, hepatic extract, prostatic extract, extract of bile, or extract of myocardium, all of which receive due mention in the text.

The author devotes two pages to a schedule of extracts from most of the more important and some of the less important organs in the body; full therapeutic indications and dosages are given for each extract. If seeing is believing, and if believing may spawn a faith which will yield results, this schedule of itself should enormously simplify some of our therapeutic problems in Geriatrics.

The attentive and discriminating reader may eventually find himself repaid by a review not only of the body of the book, but of the two prefaces by the author, the introductions by Nascher and by Jacobi, and the useful final bibliography of some two hundred titles,—a bibliography which curiously enough contains not a single reference to publications upon the subject by the author of the compilation.

The dietitian is aware that bran in excess may be irritating to a sensitive intestine. Similarly, the reviewer is left with an uneasy feeling that for the average mental palate, an excess of bran has been provided in this book in proportion to the mental wheat offered. The possible resulting mental irritation or indigestion which may affect the reader, is conceivably sufficient in degree to detract from the possible total of good which might otherwise have followed upon the contemplation and inward digestion of the good which is within the volume.

*Aids to Medical Diagnosis*. By ARTHUR WHITNEY. Pp 170. New York: William Wood & Co., 1924.

There is considerable wisdom contained in this small volume, which is written by a man with broad point of view and large practical experience; and although in an attempt at completeness, which cannot be successful in a handbook, paragraphs are included which are obvious and uninteresting, on the whole the little book is well proportioned. The chapter on the nervous system is inadequate, but the volume contains many observations of value, and stresses the important points in general diagnosis.

*Dosage and Solutions*. By C. E. GARNSEY. W. B. Saunders Company, Philadelphia and London. 111 pages.

This little book contains a great amount of information in small space. It consists essentially of general directions for writing and filling prescriptions, the usual tables of weights and measures, and a brief pharmacological summary. Special attention is paid to the mathematics of dosage, several chapters being devoted to problems on ascertaining the proper dosage from preparations of varying strengths. We believe it would be a valuable help in teaching nurses the technic of administering drugs.

**Case Records  
of the  
Massachusetts General Hospital**

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN  
WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY

RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

**CASE 10321**

*First entry.* An American of sixty-nine entered October 25 complaining of chronic diarrhea and rectal pain. He was formerly a mechanic and small contractor.

F. H. His mother died of "dysentery."

*Habits.* Good, except that he slept poorly.

P. H. He had had chickenpox, measles, mumps, whooping cough and malaria. At twenty-two he had dysentery. He had always been a vigorous worker until the present illness. Several years ago his urine was red. This condition cleared up spontaneously. At times he had dribbling. For a considerable period he had had a tendency to "asthma," and for the past ten years had lived in hilly regions because of this. He had slight dyspnea on exertion. Many years ago he had piles, but he had not noticed them for at least ten years.

P. I. Sixteen months ago, when he was feeling very well and doing full work as carpenter, he suddenly had sharp knife-like non-radiating pain in the rectum which caused him to double up. This pain was intermittent, lasting half a minute and recurring at intervals of five minutes. It was usually relieved by moving the bowels or passing gas. At the same time he began to have diarrhea, five to twenty watery stools a day and three to four at night, containing clots of dark red blood. There had been days when he was fairly free from pain and diarrhea, but periods of marked exacerbation had persisted. His appetite varied. If he ate a good deal the blood in his stools was scarcely noticeable, but if the intake was small there was more blood. He had slight nausea after eating a large meal. If he had marked rectal pain immediately after eating he often vomited the food just eaten. He seldom had gaseous eructations. Once in the autumn he was almost unable to get out of bed, had an "all gone" feeling, and noticed little yellow spots on his hands and face. This attack made him spend four weeks in a hospital. Since the onset his weight had fallen from 140 to 119 and he had lost much strength.

Examination in the Out-Patient Department October 22, three days before admission, showed

the pupils unequal, the cardiac dullness to percussion 3 cm. to the right and 12 cm. to the left, and a tender movable mass midway between the left costal margin and the ilium.

P. E. A pale, emaciated old man. Slight ptosis of the right eyelid. *Lungs.* A few moist râles at the bases posteriorly, more on the right. *Heart* enlarged. Apex impulse in the fifth space. Left border of dullness 10 cm. to the left, 1 cm. outside the midclavicular line. No other measurements recorded. Sounds of fair quality. A few extra systoles. Short reduplication of first sound at apex. Artery walls palpable and tortuous. *B. P.* 100/50. *Abdomen* normal. No mass. *Genitals.* Atrophy of left testicle. Left inguinal hernia with truss. *Rectal examination.* Sphincter very tender. After an enema a small tender fungated mass was felt on the right wall of the rectum part way up. Blood on examining finger. Proctoscopic examination confirmed these findings. *Pupils and reflexes* normal.

*T.* 98°-99.8°. *P.* 65-91. *R.* 17-28. *Urine.* Normal amount, alkaline at one of two examinations, sp. gr. 1.010-1.012, no albumin or sugar. *Blood.* Hgb. 65%, leucocytes 8,400, polynuclears 80%, reds 4,000,000-4,140,000, moderate achromia, platelets not remarkable. *Wassermann* negative. *Stools.* Mucus and macroscopic blood at one of four examinations. Guaiac very strongly positive at all. *X-rays.* *October 27.* The barium filled the lower half of the rectum and did not proceed further, apparently meeting an obstruction at this point. The rectum was dilated and the upper margin irregular in outline and somewhat mottled. *November 1.* Diaphragm low, with limited respiratory movement. Outline sharply defined. Costophrenic sinuses clear. Both lung fields bright, without abnormal shadows. No marked change in the hilus shadow. Heart a little large. Aorta prominent. *First surgical consultant.* "... Palliative operation advised." *Second surgical consultant.* "... Opening admits finger tip. No evidence of obstruction aside from diarrhea. This case may progress to a fatal termination without obstruction. A more active man would be more comfortable with a colostomy. I doubt whether this patient could care for it. We will operate if the man desires it on fully understanding the situation."

*Orders.* October 25. Colitis diet. Veronal gr. x. October 27. Veronal gr. xv. October 28 and 29. Deodorized tincture of opium minimis xx. October 30. Mineral oil 3 i 2 i d.

November 1 the patient was discharged.

*History of an interval of six months.* After discharge the patient's condition remained about the same as far as symptoms referable to the intestines were concerned. Toward the end of the interval signs of obstruction began to develop more acutely. Weakness of course

progressed considerably, and loss of weight to the point of cachexia. A few days before readmission he developed cough and fever.

*Second entry, May 13.*

P. E. (As before except as noted.) An emaciated, dried up, cachectic old man giving off a musty odor and crying out from attacks of cramp-like pain in the abdomen, which was very

tender, not palpable. Masses shown in diagram stood out, hard, painful and fastened to deeper structures. Other masses not readily outlined felt in abdomen. Much gas and fecal (?) material. *Rectal examination.* Sphincter lax. Rectum ballooned out. Prostate small and firm. A large irregular cauliflower mass felt high up, completely obstructing upward passage of finger. No opening disclosed in it.



October 27. Barium filled the lower half of the rectum and did not proceed further, apparently meeting an obstruction at this point. The rectum was dilated and the upper margin irregular in outline and somewhat mottled.

sensitive to touch. Mucous membranes pale. Throat red. Mouth dry. Tongue furry. Breath foul. Sclerae injected. Teeth all gone except several dirty and carious snags set in spongy gums. All superficial lymph nodes large, and those in supraclavicular, inguinal and axillary chains hard and shotty. Ribs exposed and interspaces sunken. *Lungs.* Apices hyperresonant. Bases posteriorly slightly dull, with fine moist and bubbling râles. *Heart* rapid. Tic-tac rhythm. Faint sounds. No murmurs distinguished. No enlargement to percussion. *B. P.* 90/70. *Abdomen* rigid and tender throughout. Liver seemed well down from costal margin.

*T.* 104.6°-99.8°. *P.* 102-140. *R.* 13-40. *Urine* and *blood* not recorded.

The patient went rapidly downhill and died May 15.

DISCUSSION

BY DR. RICHARD C. CABOT

NOTES ON THE HISTORY

This apparently is not his first attack of bowel trouble.

At sixty-nine of course we suspect prostatic enlargement.

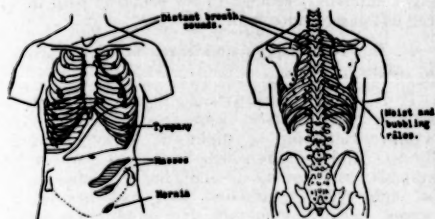


He probably found that climate made a difference to his asthma.

In relation to the symptoms for which he came here, the only point in the history is that he had had a previous attack, forty-seven years ago, of diarrhea.

Taking what we know so far, what is the thing in our minds as the most likely?

A PHYSICIAN: Cancer.



DR. CABOT: Yes; practically all of us would think of that at once. Many people would forget it because of the diarrhea and would say, Cancer causes obstruction, and this man has diarrhea; therefore he cannot have cancer. But we know that many cancers of the lower bowel do cause diarrhea, the ulceration being the thing rather than obstruction in the early stages. So much blood is the thing that brings cancer most to my mind. Chronic colitis does not show so much blood. There was more blood when his intake was small I suppose because he got more constipated and therefore the passage of feces irritated still more whatever was wrong in the intestine.

This vomiting I assume is that associated with pain. Severe pain anywhere in the body may cause vomiting.

In the Out-Patient Department they felt a mass which undoubtedly they suspected, as we must, of being due to cancer.

#### NOTES ON THE PHYSICAL EXAMINATION

The blood pressure is notably low.

The question is, who was right about the mass? They may both have been right. There may have been a fecal mass the first time which was later passed.

I take it that the rest of the proctoscopic examination was negative, that is, that there were no multiple punched-out ulcerations such as we see in colitis, that this fungated mass was the only thing there.

The question is whether this is a benign or a malignant tumor. Benign tumors of the rectum are very rare, especially at his age, and I think anybody would conclude from the facts before us now that this is cancer of the rectum.

There were only two urine examinations, so we do not know whether that was a real fixation of the specific gravity or not.

He has secondary anemia.

What they are describing in this plate (see illustration), I take it, is this mass which instead of filling the whole sigmoid to the cecum as it ordinarily does even with very slight pressure and a low tube, stops in the rectum and shows us an irregular mass. I take it this is held to confirm what we have been reading.

This second plate I suppose is the same patient seen from behind. So far as I can recognize it is a normal chest.

A PHYSICIAN: Was that lung plate taken for metastases?

DR. CABOT: Presumably.

The surgeons do not think they can save him. He went on having his diarrhea. The cough and fever are something new.

The pain was from peristalsis against the obstruction.

"The ribs were exposed and interspaces sunken" merely because of his emaciation and his age.

This condition would undoubtedly have been called emphysema a few years ago, and it may be emphysema, but I do not yet see any reason to suppose so.

"Tic-tac rhythm" is the rhythm that we get with a weak heart in such a case as this where cachexia has weakened it or with anything else that weakens the heart from within or from outside it.

They are thinking about metastases in the liver, but they do not find any lumps or irregularities to suggest it.

The masses probably are not tumor masses, but fecal, backed up behind a cancerous structure. Cancers of this part of the bowel are usually small and do not make big palpable masses.

He came in practically moribund.

#### DIFFERENTIAL DIAGNOSIS

Besides cancer of the rectum, which is a diagnosis we cannot doubt, what else have we to expect here? We certainly have every reason to expect some metastases. The commonest place for metastases is the regional lymph glands, which in this case means the mesenteric glands; from there it may go anywhere, liver, lungs, brain, etc. We did not have an X-ray of his lungs at this second entry, so we do not know by the only method by which we can know whether there are metastatic nodules in the lungs. They gave no physical signs. The lungs showed scattered moist râles, but I cannot conclude anything in particular about that as to the condition of his lungs. He might have a pneumonia with no more signs than that. He might have a purulent bronchitis, which is often seen as a terminal event with these old people. He may have merely terminal edema. But as he has been having fever it is probably something more than edema. That is as far as I can go.

His heart should be a little hypertrophied,

from what the X-ray man has said, probably associated with arteriosclerosis, since his age is sixty-nine.

#### CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Carcinoma of the rectum.  
Intestinal obstruction.  
Bronchopneumonia.

#### DR. RICHARD C. CABOT'S DIAGNOSIS

Carcinoma of the rectum with metastasis to the mesenteric lymph glands.  
Pneumonia?  
Purulent bronchitis?  
Hypertrophy and dilatation of the heart.  
Arteriosclerosis.

#### ANATOMICAL DIAGNOSIS

##### 1. Primary fatal lesion

Carcinoma of the rectum with intestinal obstruction.

##### 2. Secondary or terminal lesions

Bronchopneumonia.  
Arteriosclerosis.  
Slight hypertrophy and dilatation of the heart.

##### 3. Historical landmarks

Slight chronic pleuritis.  
Left inguinal hernia.

DR. RICHARDSON: The subcutaneous fat was small in amount, the muscles thin, soft and pale. The left inguinal canal contained a loop of intestine which was easily removed. At a point about nine cm. above the anus the rectum presented a mass which is well shown in the X-ray and very well described in the clinical record,—a frank mass of new-growth tissue, adenocarcinoma, extending around the wall of the intestine, and on cross section showing thickened walls with infiltrating new growth, and a short distance below the wall a few small glands. The large intestine above the new growth contained a great amount of soft fecal material.

There were a few old adhesions at the right apex and a few to the diaphragm on the left. The trachea and bronchi contained much mucopurulent material.

The lungs showed some edema, a little emphysema in the peripheral portions of the lobes, and in the lower lobes scattered areas of bronchopneumonia.

The heart weighed 380 grams, slightly enlarged, with a good myocardium and valves and cavities negative. The coronaries were free but showed considerable fibrous sclerosis with some diminution of the lumen in places. The aorta and great branches showed well marked arteriosclerosis.

The left testis was small.

The head was not examined.

This was a clear-cut case of carcinoma of the rectum which was massive enough to produce considerable obstruction.

#### CASE 10322

*First entry.* A colored widow of twenty-eight entered December 13 for relief of pain in the left chest and cough.

F. H. Nine sisters and three brothers died in infancy.

P. H. "She must have been born with asthma." The attacks were related to cloudy weather, climbing a flight of stairs, lying down, and excitement; not to season, animals or flowers. She had pneumonia at eight years, and had also had measles, scarlet fever and mumps. Her colds were so frequent that she was never absolutely free from them.

*Habits.* Good. Sleep poor. She had gained nine pounds in the past seven months.

P. I. Two weeks ago she had sudden onset of sharp pain over the precordia shooting through the chest to the back. The pain was now localized in the left costovertebral angle, where there was extreme tenderness. Breathing aggravated it. The onset was accompanied by chilly sensations. Since the onset she had urinated twice at night. The urine was high colored. Six days ago she had a night sweat. The following day she spat up half a spoonful of bright blood. For five days she had had fever and had been in bed. She had eaten little for two weeks. Five days ago there was questionable jaundice of the conjunctivae.

P. E. Fairly nourished. Numerous pigmented maculae over the chest, arms and abdomen. Sclerae injected. Lips dry and cracked. Throat somewhat injected. Some pyorrhea. Cervical glands slightly enlarged. Inguinal glands the size of beans. Apex impulse of the heart not found. No enlargement to percussion. Action rapid. Sounds of fair quality. Soft systolic murmur at the apex. Faint systolic at the base. A<sub>2</sub> slightly accentuated. B. P. 125/85-115/70. Lung signs as shown in Figure I. Breathing shallow. She preferred to lie on the left side. Abdomen slightly distended, tympanitic except over flanks, where there was dullness and slight flaring. Some general rigidity, most marked in the epigastrium, but especially over the right upper rectus, where there was tenderness and spasm. Genitals not examined. Extremities normal. Reflexes. Knee-jerks much exaggerated.

For the first five days T. 97.9°-102°, with wide swinging, P. 109-76, R. 23-35. After December 18 T. 99.8°, falling to normal by Decem-

ber 22, P. 72-95, R. 32, falling to normal by December 21. *Urine.* Normal amount, sp. gr. 1.012-1.020, dark at the first of three examinations, the very slightest possible trace of albumin at the first. *Blood.* Hgb. 85%, leucocytes 8,400-11,800, polynuclears 82%, reds showed some achromia. One Wassermann negative, one mildly positive. *Report of skin consultant.* "Eruption perfectly compatible with the positive Wassermann."

KI and mercury were started by mouth but were discontinued December 19, as she devel-

nycturia, often six times a night. For the past few weeks the urine had been reddish.

*Second entry.* She reentered March 24 complaining of cough and pain in the chest.

P. I. Three weeks ago she caught cold with severe cough and anorexia. She continued to work until two days ago. Then she had a severe chill and the cough became much worse. She began to have severe pain in the left lower chest aggravated by cough which kept her awake at night. For two days she had raised reddish sputum.

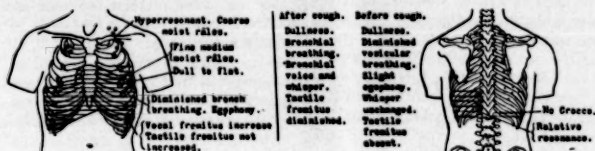


FIGURE I.

oped a stomatitis. December 20 fluoroscopic examination showed a definite process at the left base as large as the palm of the hand, its center more dense than its margins. The dome of the diaphragm could be made out and moved slightly with respiration. The process was rather more distinctly seen from the back than from the front. The lungs were otherwise normal except for slight peribronchial thickening.

By December 21 the patient was feeling better. The diffuse bronchitis had cleared up. The lung signs were as shown in Figure II. One dose of influenza vaccine had been given.



FIGURE II.

The patient was put in position for chest drainage twice a day, and at these times raised about four ounces of yellow purulent sputum. At other times she had no cough or sputum. December 27 six-tenths of a gram of salvarsan was given intravenously. December 28 the right lung was clear. The signs on the left were as on December 20. The patient felt perfectly well and insisted upon going home. She was accordingly discharged, with directions to go to the Out-Patient Department for antiluetic treatment.

*History of an interval of twelve years.* The attacks of asthma had continued. Three years before readmission her only pregnancy ended in a Caesarian section. The child was living and well. She passed the menopause five months ago. For three months she had had dyspnea on exertion. Recently she had been troubled by

P. E. A thin, sick woman with increased respiration. Old pigmented lesions over the chest. Old scars on face from trauma. Teeth very poor. Marked pyorrhea. Throat and tonsils red. Chest signs as shown in Figure III.

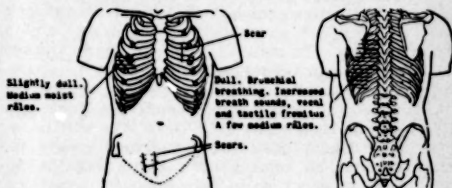


FIGURE III.

*Heart* rapid. First sound loud. Apical systolic blowing murmur. B. P. 125/75. *Abdomen* distended.

T. 102.5°-104.8°. P. 99-120. R. 44-70. *Urine.* Amount recorded only once, then normal, sp. gr. 1.018 at two examinations, a very slight trace of albumin at the first examination, leucocytes at the first. *Blood.* Hgb. 75%, leucocytes 11,600-11,000, polynuclears 61%. Wassermann negative. *Non-protein nitrogen* 28.7 mgm. March 25 blood cultures I and II showed no growth.

*Orders.* March 24. Precautions. Soft solids. Force fluids. Digitalis gr. 1½ a day. Morphia gr. 1/8 s.c. every three hours p.r.n. for pain or sleep at night. Watch for distension. Russian oil 3 i every night. March 26. Codeia gr. 1/2 by mouth every three hours for cough. Morphia gr. 1/8 s.c. Caffein sodium salicylate gr. x s.c. for weakness of pulse p.r.n.

The patient progressed fairly well until the

evening of the 26th, when she seemed somewhat weaker. Quite suddenly at quarter to two the next morning she became worse, and ten minutes later she died.

#### DISCUSSION

BY DR. MAURICE FREMONT-SMITH

#### NOTES ON THE HISTORY

The history suggests the possibility of syphilis in the family and of congenital syphilis in the patient.

The attacks of asthma are of the sort that occur when there is a chronic pulmonary infection or a focus in the upper respiratory tract. Such asthmatic bronchitis occurs usually in older people, and the attacks come on after the symptoms of mild respiratory infection, in contrast to the attacks of real bronchial asthma, which come out of a clear sky, usually start in young people, and are associated with definite sensitization to certain proteins. Here pneumonia may have been the cause for her persisting pulmonary infection.

The attack of sudden sharp pain suggests pleurisy. It might occur in aneurism, although in aneurism one usually has a dull persisting and gradually increasing pain in the chest.

The extreme tenderness in the left costovertebral angle is an unusual finding in any type of pleurisy. It would in itself, of course, suggest a perinephritic abscess.

Hemoptysis always suggests tuberculosis. Especially is that true whenever a frank hemoptysis occurs out of a clear sky with no, or very slight, preceding symptoms. Sixty per cent. of all tuberculous patients have hemoptysis at some time. Other causes for hemoptysis must be considered. Perhaps the next most frequent is pneumonia, in which one gets bloody sputum but very rarely frank hemoptysis. In chronic passive congestion one frequently gets bloody mucus, but again rarely frank blood. In pulmonary infarct, either as a result of a vegetation coming off the mitral valve or of a preceding phlebitis, one has bloody sputum, again a small amount, usually mixed with sputum. Of course in such a case one would have pain and probably dyspnea also. However, the pain in this case was long preceding the onset of hemoptysis. Another cause of hemoptysis is lung abscess or gangrene, in which the hemoptysis is usually small.

#### NOTES ON THE PHYSICAL EXAMINATION

The signs found in the examination of the lungs are those of a diffuse bronchitis and some definite pathology in the left lower back. The signs showed very definite change after cough, which sometimes happens in a frank massive lobar pneumonia, where signs will change from those of fluid to those of frank pneumonia after a bronchus has been cleared out. The more

common cause for a change of signs such as this occurs in the clearing out of a cavity. The dullness at the left base of course may be due to fluid, and the fact that the onset of the illness began with sharp pain in the side suggests that there was an involvement of the pleura at the beginning. But there is more resonance against the spine than farther over. There is no Grocco sign. I think it is very difficult to say whether there is or is not a small quantity of fluid at this base, but probably the definite signs here are caused by an area of consolidation about a cavity.

If this observation is correct as to the spasm, we should infer that there was some pathology in the right upper quadrant. Often in pneumonia, however, with irritation of the diaphragm one has abdominal symptoms without pathology in the abdomen. Certainly the lung signs here overshadow the abdominal.

The question of congenital lues should have been carefully excluded. We should like to know about any interstitial keratitis, scars about the mouth, etc.

We should like to know whether there was bile in the urine, and in view of the localization of her tenderness we should like to know the sediment findings. Localized tenderness is a sign too important to be overlooked.

MISS PAINTER: Urobilinogen was strongly positive at the first urine test.

DR. FREMONT-SMITH: There is a question whether she had a mild infection of the liver with backing up of bile rather than anything in the gall-bladder.

Of course any skin lesion is compatible with a positive Wassermann, and that statement does not help us very much. We should like to know whether or not it was definitely suggestive of lues or whether it might be explained by some other condition.

MISS PAINTER: The skin consultant thought it was probably luetic.

DR. FREMONT-SMITH: I should like to know about her sputum, whether or not tubercle bacilli were there, whether there was any elastic tissue; but probably there was no report.

MISS PAINTER: It was loaded with influenza.

DR. FREMONT-SMITH: Again the question arises as to whether there is or is not a little fluid at that base. Probably yes, as well as a definite area of abscess.

In spite of the influenza in the sputum I doubt very much the indication for the influenza vaccine.

Of course they were treating a positive Wassermann and a skin trouble; the lung condition could not be a luetic one.

The chief facts we want in the interval history have been left out. What happened to that lung abscess? Of course this brings up the treatment of lung abscess, whether one should treat by postural drainage or should operate. I think if a lung abscess is of short duration, if



there are marked signs of sepsis, and if the localization can be exact, operation is indicated. Of course the longer one leaves an abscess undrained the more difficult operation becomes and the less chance there is for cure. On the other hand the results of operative drainage in lung abscess are very frequently not successful, and many cases unoperated spontaneously result in cure, as this case apparently did. Unless it seems necessary for the immediate welfare of the patient, that is, unless sepsis is so severe that the patient is really in danger, or a definite sepsis keeps up without improvement over a period of weeks or months, I should feel that operation would better be delayed and postural drainage tried. Recently by bronchoscopy certain abscesses near the larger bronchi have been successfully drained, and this possibly opens up a method of better treatment. Is there anything in the notes as to what had happened to the lung condition?

DR. CABOT: Her asthma seems to have gone on.

DR. FREMONT-SMITH: But she was not draining large amounts of pus. She had not developed amyloid kidneys or metastases to the brain. She had had a pretty successful twelve years without operation.

DR. CABOT: Yes.

DR. FREMONT-SMITH: In other words she has developed lobar pneumonia, which she might have done if she had had no previous lung infection.

Figure III shows massive consolidation in the lower left chest.

She was not reacting very well to her infection. We should hope for a higher leucocyte count than this with lobar pneumonia.

#### DIFFERENTIAL DIAGNOSIS

The immediate cause of death I do not see how we can discover from this description. She may have died of acute cardiac failure. But the description is not sufficient. She may have had a pulmonary infarct.

I should say that we have here evidence of a frank lobar pneumonia. Whether or not we shall find any evidence of the cavity in the shape of old adhesions in that lower left chest, any fibrosis of the lung, it is hard to say. We shall find, probably, a normal heart and kidneys. And again I should not be surprised to find very little evidence of syphilis, possibly something in the arch, but I see no reason to think that we shall find anything.

DR. CABOT: I think it is not impossible that the bronchiectasis which she may have had at the beginning there lasted all those twelve years. I have followed patients with bronchiectasis longer than that, and while they have had a great deal more than this woman complained of, she being a negro may not have complained as much as more highly organized people would. And of course in bronchiectasis pneumonia is a

frequent complication and cause of death. It seems to me perfectly conceivable therefore that Dr. Richardson will find evidence, not of a healed abscess, which is the first thing one would naturally think of, but of a bronchiectasis with terminal pneumonia. On the other hand I am not at all sure that it was not abscess and nothing but abscess; but I think the other possibility has to be entertained, and I cannot think of any third.

DR. RICHARDSON: The Wassermann finally was negative, wasn't it?

DR. FREMONT-SMITH: Yes.

#### CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Lobar pneumonia.

#### DR. FREMONT-SMITH'S DIAGNOSIS

Lobar pneumonia.

#### ANATOMICAL DIAGNOSIS

##### 1. Primary fatal lesion

Purulent tracheitis and bronchitis with bronchopneumonia and areas of necrosis and suppuration.

##### 2. Secondary or terminal lesions

Acute pleuritis, left.

##### 3. Historical landmarks

Scars of old operation wounds.  
Obsolete tuberculosis of one bronchial gland.  
Slight chronic pleuritis.

DR. RICHARDSON: There was no evidence of syphilis in this case and only one evidence of tuberculosis, one bronchial gland.

There was a linear scar in the anterior abdominal wall extending from the pubes up. The uterus seemed to be normal, although I noticed the story that it had been opened. I found no evidence of that. The left tube and ovary were wanting.

In the region of the inner border of the left breast there was an old linear scar eight cm. long.

The anterior margin of the liver was fifteen cm. below the border in the right mammary line. That is pretty well down.

The diaphragm on the right was at the sixth rib, on the left at the sixth interspace. Those are both down. Yet the pleural cavity on the right was negative, and on the left contained only a few c.c. of thin cloudy fluid. There were a few scattered old adhesions on the right and a few on the left. The pleura over the lower half of the left lung showed fibrinous pleuritis.

The trachea and bronchi contained a large amount of dirty brownish mucopurulent granular material. The mucosa was coated with mucopurulent material, granular in places and with small masses of foul necrotic material.

This condition extended down into the bronchial tree on each side even to the remotest twigs. Cross-section showed areas resembling pneumonia, other areas of necrosis, and intermingled with these small abscesses. The lungs on either side seemed to be very much alike; both were markedly involved. The bronchial glands were enlarged, pigmented, soft, and one of them showed some fibrocalcereous degeneration. In the section surfaces of the lung the cut ends of the bronchi yielded much pus and purulent plugs.

The liver was rather large, 1738 grams, but showed no lesions. The spleen was rather small, 127 grams, the tissue a little soft.

The head was not examined.

DR. CABOT: You would not think the diagnosis of bronchiectasis was in any way contradictory to what you have said?

DR. RICHARDSON: No.

DR. CABOT: But it was a long-standing process. Dr. Lord often says we ought not to talk so much about bronchiectasis; we ought to call it bronchopulmonary infection, because there is just as much in the way of pneumonitis. We have fixed on one feature (dilated bronchi) and named a disease by it when really it is only a fraction of the disease. This case shows just as much disease on one side as on the other, and it is the second recent occasion when our attention was firmly focused on one side yet the post mortem has refused to confirm our unilateral predilection.

What do you suppose happened twelve years ago? It was a history like abscess. She came in here, got entirely well, and went out.

DR. FREMONT-SMITH: And the X-ray findings were entirely negative except in that one place.

DR. CABOT: Yet you see the history goes away back to childhood; my guess is that she had some trouble on both sides even twelve years ago. Yet the X-ray did not show it.

DR. RICHARDSON: That is more likely. The respiratory tract seems to have been her weak point.

DR. CABOT: My guess is that twelve years ago she came in for an acute pneumonia around her chronic bronchiectasis. One patient I have watched a long time has had eight attacks of acute pneumonia. If she gets through a year without it she is lucky.

DR. FREMONT-SMITH: It is another case against operating on a case of lung abscess with a long history.

DR. CABOT: Yes. You certainly must have seen a great many cases, as I have, when they operated for lung abscess, got in there, found this condition, bronchiectasis, and wished they hadn't operated.

DR. YOUNG: The operation under those conditions is never successful, and it is very hard to tell the difference between bronchiectasis and abscess.

# CASE 10323

*First entry.* An Irish laborer of thirty-three entered April 1 complaining of tenderness in the right side of the abdomen.

P. H. Negative except for a "cold in the head" and a furuncle on the neck four weeks ago. He had not worked since the onset of these. The cold had persisted, with considerable cough at night with sputum and moderate sweating.

P. I. Two weeks ago he noticed soreness on the right side of the abdomen one or two inches below the ribs, with considerable steady pain, worse at night. Four days before admission he vomited just after drinking milk. He was not confined to bed until the three days before admission. His bowels had been constipated, moving only after taking salts. His only complaint at admission was pain and soreness in the right upper quadrant.

P. E. Negative except *lungs*. In the left back above the spine of the scapula was an area of dullness, distant voice sounds and absent tactile and vocal fremitus. A few coarse bronchial râles over the right back. *Abdomen* full, soft and tympanitic throughout. Very slight tenderness over the right rectus, chiefly at the level of the umbilicus. Slightly more resistant on the right than on the left. Tenderness extended upward under the costal margin rather than down.

Before operation *chart* normal, *urine* and *blood* not recorded.

April 2 appendectomy was done. Unusual bleeding was encountered in the abdominal wall. The appendix was found bound up in adhesions. It was freed and delivered with great difficulty and amputated. He made an uneventful convalescence. April 5 the urine was essentially negative. April 11 he was discharged much relieved to the Out-Patient Department.

*History of an interval of thirteen years.* Ever since his previous entry at varying intervals he had suffered the same acute right upper quadrant pain that he had before operation. It occurred at any time, although it was more frequent at night, lasted three or four hours, and seldom caused vomiting (he had not vomited for three years). For periods of ten days to two weeks the attacks occurred almost daily, with periods of remission at first as long as a year and a half, usually, however, less. For two years beginning nine years ago the attacks were much more frequent, and he was very ill with them. He was put on a "rigid diet" eliminating fried foods and salt meats. He gradually improved. Three years before admission he was treated at a Boston hospital and kept on a modified Sippy diet. Since leaving that hospital he had been under the direction of its Out-Door Department. His diet had been followed and he had been given Sippy's powders. For the

past month he had been suffering from almost daily attacks of the old pain. His bowels had been constipated for years.

Second entry, December 21.

P. E. Well nourished. Teeth very carious. Marked pyorrhea. *Heart and lungs.* No abnormalities recorded. *Abdomen.* Three-inch right rectus sear, firm. Slight tenderness to deep palpation beneath sear. Right upper quadrant and epigastrium showed no definite spasm but were difficult to palpate because of slight voluntary rigidity and fair muscular development. Questionable tenderness in the right flank beneath the costovertebral angle. About 4 cm. below the right costal margin was a mass, not definitely palpable.

Before operation *T.* 98°-100°, *P.* 61-102, *R.* 23-18, *urine* pale, alkaline, sp. gr. 1.015, sediment negative. *Blood.* Hgb. not recorded, leucocytes 7,500, polynuclears 70%, reds 4,360,000. *X-ray.* Stomach low and atonic. Peristalsis active, but owing to the presence of food material and gastric secretion diluting the barium its study was unsatisfactory. No definite irregularity of gastric outline could be made out. Nothing passed the pylorus during observation, and the duodenum was not seen. Examination inconclusive.

December 26 operation was done. He had persistent vomiting after it and December 28 burst one of the stay sutures, causing the wound to gape a little. The abdomen was distended with gas. He was having morphia and enemata. The next afternoon a stomach wash was given because of persistent vomiting. There was no more vomiting until midnight. Then it began again. December 30 another stomach wash was given. After this there was no vomiting. The temperature, which had risen gradually since the operation, was 102° that afternoon, the highest it had been at all. The distension continued, relieved only temporarily by a rectal tube. Two of the stay sutures had come out, but there was only a little gape in the wound superficially.

At two o'clock the next morning the patient became distinctly worse, with severe pain in the epigastrium and tenderness and spasticity over the right side. The temperature rose to 105.2°, the pulse to 140, the respirations to 50. The pulse was weaker. The distension increased. The vomiting and the other symptoms persisted with increasing shock until his death that noon.

#### DISCUSSION

BY DR. EDWARD L. YOUNG, JR.

Any patient who comes in with a story of having had a cold in the head or a furuncle within the past month ought always to bring up two questions in our mind to influence us in any decision regarding an operation. First, is there

anything left behind of the cold which under the irritation of an anesthesia might flare up and make serious trouble? When, as with this patient, there is evidence of continued trouble with cough, sputum, and moderate sweating, examination ought to be very thorough before needlessly subjecting a patient to an anesthetic. The second question that ought to arise in the face of any infection is, can I associate the present story with the infection which now may be showing metastatic manifestations? In this patient the story seems to me very confusing. It is not the story of an appendix, it is not that of a gall-bladder, although it would fit with that better than with an appendix. In view of the work on the selective action of bacteria we wonder if perhaps a duodenal ulcer has been started on the basis of one of the two infections already spoken of. It seems to me the history does not help us any more than that, and that further study is absolutely necessary before any treatment can be indicated. One other condition ought to be mentioned, and that is the possibility of a mild hematogenous infection of the kidney, which would show little if anything in the urine and would give symptoms such as are here described.

Examination seems to bear out the possibility of some slight remnant of his cold persisting in the lungs, and again would make us hesitate to start up the irritation of a general anesthetic unless it was definitely necessary.

The abdominal examination does not help us at all. It is consistent with any one of the conditions which I have mentioned, and also consistent with mild appendix, although we should not expect the tenderness to extend upward in that case.

I do not believe that on the evidence here presented any operation is justifiable. There is no urine examination, and certainly no urgent need of operation, so that a delay for further study and a chance to lessen the irritation in the lungs would seem to be indicated.

Knowing the fondness for the diagnosis of chronic appendicitis we can see at once what was done. The appendix was attacked and removed. In spite of the description of the appendix I do not believe it was the primary cause of trouble. It may well have been the innocent bystander who got hit with some flying bricks, but I doubt if it was actively engaged in the fracas.

The history of the interval seems to bear this out, as the operation had no effect on the symptoms. The fact that this pain seemed to come with a certain periodicity, the fact that it occurred at night, at the time when his stomach was most likely to be empty, the fact that diet helped, that alkalies helped, would suggest that the trouble is located in the duodenum. If so a careful X-ray study ought to help.

The abdominal examination does not give us any more aid than it did before. The X-ray al-

though not conclusive does suggest pyloric obstruction, and because the gastric outline itself was not irregular, seems to back up the possibility of duodenal ulcer. There cannot be a large amount of pyloric obstruction or we should have more vomiting and we should not be told that the patient was well nourished. Again I do not see why operation had to be rushed, and why a little more careful study could not have been given. From the knowledge we have I assume that operation was done for duodenal ulcer. That diagnosis is the one which fills the bill, and was I believe the original diagnosis thirteen years before—another instance in which the use of the diagnosis of chronic appendicitis does harm.

#### DR. YOUNG'S PRE-OPERATIVE DIAGNOSIS

Duodenal ulcer.

#### PRE-OPERATIVE DIAGNOSIS

Duodenal ulcer.

#### OPERATION

Gas-ether. Right rectus incision. Three-quarters of an inch beyond the pylorus the duodenum was narrowed, much thickened, with a hard mass involving the pancreas posteriorly. A deep crater could be felt through the wall. The first decision was to do a Finney operation, but it was found that the second portion of the duodenum was very short and with the duodenum turned sharply beneath the pancreas. This second portion was involved in cicatricial tissue about the ulcer. Pylorotomy was therefore undertaken. This was made difficult by the short second portion of the duodenum and its relation to the pancreas. In dissecting below the pylorus an ulcer was soon broken into, as the wall was very thin at this point. Dissection was continued, however, and the pylorus freed. The pylorus was cut across and the gastric opening closed by inverting sutures in two rows. The duodenal opening was then closed in a similar manner, but this was difficult because of thickening caused by the ulcer. A posterior gastro-enterostomy was then done and the wound closed in layers.

#### PATHOLOGICAL REPORT

Microscopic examination showed no ulceration. There was slight fibrous thickening of the submucosa and peritoneal surface.

H. F. HARTWELL.

#### FURTHER DISCUSSION

The description of the condition present would suggest that the duodenal end of the suture may have torn loose and the patient may have had a spreading peritonitis.

I think that Dr. Richardson will find a more or less general peritonitis with a leak in the duodenal end of the suture.

#### CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Duodenal ulcer.

General peritonitis.

#### DR. EDWARD L. YOUNG'S DIAGNOSIS

Duodenal ulcer.

General peritonitis.

#### ANATOMICAL DIAGNOSIS

##### 1. *Primary fatal lesion*

Necrosis of the wall of the duodenum with necrosis of the walls of the common bile duct and the duct of Wirsung with interruption in their continuity.

##### 2. *Secondary or terminal lesions*

Localized peritonitis.

Disintegration and fat necrosis of the retroperitoneal tissues.

Laparotomy wound.

DR. RICHARDSON: The head was not examined.

The examination was made through an operation wound in the anterior abdominal wall. There was some distension of the abdomen, but the abdominal wall was only slightly tense. Much thin dirty bloody fluid ran from the nose and mouth.

In the region of the right flank there was a collection of dirty brownish bile-like fluid with shreds of necrotic tissue and fibrinous material. The peritoneal cavity elsewhere was free from fluid. The appendix was wanting. The stomach was sutured off just above the pylorus. The sutures were apparently intact. Just above this region and along the greater curvature a gastro-enterostomy was established by the posterior route. It was in good condition. The stomach otherwise was negative. In the region of the first portion the wall of the duodenum was infolded and the duodenum was sutured off. The sutures were intact. The infolded portion of the wall of the duodenum was unfolded and found to consist of a normal appearing portion with the upper margin of which a broad dirty blackish-red necrotic portion of the duodenal wall was continuous. Just below the lower margin of the necrotic portion lay the ampulla of Vater. It was normal in appearance; but a probe passed through its canal for a short distance and then into the retroperitoneal tissues, which were more or less necrotic and showed numerous areas of fat necrosis. The small intestine below the gastro-enterostomy was considerably distended and contained much dirty opaque semi-fluid material. The mucosa was negative.

The lower end of the common duct was necrotic and opened into the region of the necrotic retroperitoneal tissue previously mentioned. The surface of the head of the pancreas in this region was a little irregular and showed a few



small areas of fat necrosis. The duct of Wirsung opened into the necrotic retroperitoneal tissue mentioned and near the necrotic end of the common bile duct. The duct of Wirsung was free, but its mucosa was dirty greenish black as if bile-stained. In the necrotic retroperitoneal tissues in the right flank and beginning in the region of the head of the pancreas there was a flattened cavity which extended from the inferior surface of the liver down nearly to the cecum and over to the left as far as the wall of the duodenum and invaded the perirenal tissues somewhat. This cavity contained 250 c.c. or more of dirty brownish fluid material with shreds of necrotic tissue and fibrinous material. In the retroperitoneal tissues in the region of the right flank and well marked in the perirenal tissues on this side there were many smaller and larger areas of fat necrosis. Areas of fat necrosis were also numerous in the retroperitoneal tissue and the perirenal tissue on the left.

The pancreas, except for a few small areas of fat necrosis on its surface, was negative.

The abdominal aorta showed a few small scattered areas of atheromatous sclerosis.

patient is highly suggestive. Many practitioners fail to recognize this important period, and consequently sow the seeds of a traumatic neurasthenia themselves. The patient's family, especially a sympathetic wife, often are other factors in fixing the idea of a severe injury in the patient's mind.

Buzzard would classify all head injuries into three groups. First, true traumatic neurasthenia, in which there is a definite head injury with concussion. Patients of this type he believes can usually be prevented from developing neurasthenia if great care is exercised not to suggest symptoms to the patient, and adequate rest in bed is prescribed. Difficulties are greatly increased, however, if the question of responsibility is a dominant factor.

Secondly, he makes a "contusion" group. The patients recover from the effects of their head injuries in all respects except one. Physical exertion brings on localized headache. Surgery may reveal some slight lesion of the brain or its covering membranes at the point of the injury.

In the third group Buzzard places cases of anxiety neurosis following trauma in which the patients attempt to shift the responsibility away from themselves. This group of patients he would separate from the true traumatic neurasthenia cases classified under the first group.

This clear, concise paper is well worth reading in full. It also has appeared in *The Lancet*.

[H. R. V.]

## CURRENT LITERATURE

### ABSTRACTORS

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BRYANT D. WETHERELL	HENRY R. VIETS

### TRAUMATIC NEURASTHENIA

E. FARQUHAR BUZZARD (*Mental Hygiene*, Vol. 8, No. 12, April, 1924) gives his conception of this difficult subject in an address to the Oxford Medical Society, in November, 1923. The subject is of great interest to the medical and legal profession on account of its tremendous economic importance. Traumatic neurasthenia is difficult of definition, but Buzzard points out that it is really identical with the clinical picture of anxiety neurosis. He thinks that the importance of one factor in all cases of traumatic neurasthenia has been underestimated: the question of responsibility. If the patient can shift the responsibility to others, the initial preparation of a soil favorable to the growth of neurasthenia has been accomplished. He cannot recall a single case in which the responsibility for injury has not been placed away from the patient. He then gives as illustrations theoretical cases of industrial accident as compared with injuries of equal severity occurring in patients taking part in such a sport as hunting. Buzzard points out the importance of preventing this disease, especially from the point of view of the practitioner who often over-emphasizes the gravity of the condition at a time, shortly after the accident, at which the

### THE CARE OF DEFECTIVE DELINQUENTS

SANFORD BATES (*Mental Hygiene*, Vol. VIII, No. 2, April, 1924) reviews the first 18 months of work of the Department of Defective Delinquents at the State Farm, Bridgewater, Mass. This department is one of two or three in the United States. He feels that segregated care of the defective delinquents is no longer an experiment and that the operation has been particularly successful in Massachusetts due to close confinement, rigid discipline, kindly and humane treatment, the precision and prompt obedience required by military control, consistent employment in industry or farm operation with frequent changes of employment, sufficient rest and recreation, confinement not in box cells but in individual rooms with outside windows, accurate diagnosis before commitment based upon examinations by psychiatrists, and the always present hope in the minds of the inmates that some day they may progress far enough to take their places in the community once more. Satisfactory arrangement has been made with the Board of Parole whereby they are not to release inmates except with the approval of the medical director, the supervisor, and the agent. During the 18 months ten men out of a total of 108 have been released. In nine of these cases the men released have succeeded in a remarkable fashion.

[H. R. V.]

### PRINCIPLES OF THE OPERATION FOR CARCINOMA OF THE RECTUM

COFFEY, R. C. (*Surgery, Gynecology and Obstetrics*, June, 1924).

Coffey presents one of his characteristically thorough and admirable articles on this subject, upon which he has already written many valuable articles. He gives in this article the history of the advances in the treatment of this disease, showing the various steps of improvement from year to year of one operative procedure from the former, and now demonstrates by text and excellent drawings the very large extent to which rectal carcinoma can be safely excised. The article is one of great value and interest.

[E. H. R.]

## THE BOSTON Medical and Surgical Journal

Established in 1828

Published by The Massachusetts Medical Society under the jurisdiction of the following-named committee:

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### CRITICISM OF PSYCHIATRISTS AND THE LAWS PERTAINING TO EXAMINATION OF CRIMINALS

THE recent murder case in Chicago has attracted a great deal of attention, and much hostile criticism has been directed toward the psychiatric examination of these boys. The opinion seems to be rather generally held, not only by the laity, but even by prominent members of the medical profession, that the American Psychiatric Association is at fault in not working out some different plan for expert testimony of mental cases, and that any psychiatrist who has been employed by the defense is necessarily influenced in his opinion by the alleged large fees which he receives. Many of those writing on this subject are, apparently, quite ignorant of the actual facts of the case and of the general nature of medico-legal problems. There seems to be a common opinion that Massachusetts, with its present law for the psychiatric examination of prisoners, avoids all the difficulties and the undesirable features which it is assumed the Chicago case will demonstrate. There is no question but that the Massachusetts law is a distinct step forward. It does not, however, prevent both sides from hiring medical experts to testify at a trial, al-

though many people assume this to be the case. Therefore, Massachusetts law does not prevent the very thing which is being so bitterly attacked in the present Chicago case.

It is assumed by a great many persons that an impartial board of experts will do away with all difference of opinion, and that all problems will be solved by such a board. There are plenty of instances on record of difference of opinion by so-called impartial experts under the present laws of Massachusetts, and there are plenty of cases which could be cited, where absolutely contradictory opinions have been expressed as to the sanity of persons by men testifying as impartial witnesses, selected in accordance with the law.

The American Psychiatric Association has been criticised because of the present state of things. Everybody grants that the present condition is unsatisfactory, but it is not easy to formulate a better plan and secure its adoption. Attention of those who do not appreciate these difficulties is called to the recent attempt in Great Britain to improve the laws regarding the plea of insanity as a defense. A committee was appointed July, 1920, by the Lord Chancellor, the Earl of Birkenhead. The Chairman of the committee was the Right Honorable Lord Justice Atkin. The committee reported November 1, 1923. Both the British Medical Association and the Medical Psychological Association had sent a list of recommendations. The following might be quoted from the report: "After careful consideration, we come to the conclusion that we cannot accept the recommendation of the Medico-Psychological Association. We do not recommend the formation of a panel of experts, as is suggested by both medical associations. In no case would it be possible to leave medical testimony to members of the panel and thus prevent an accused person, calling evidence of his own doctor, or doctors, not on the panel. The conflict of medical opinion could not, by such means, be prevented. . . . Finally, we are glad to be able to report that the present system has been proved to work satisfactorily." Thus it will be seen that after a thorough study of conditions by very competent legal men, with the medical profession of Great Britain assisting with advice and recommendations, no satisfactory change of the situation was secured. It was not even agreed that the present state of affairs was unsatisfactory. To those who have some simple, easy scheme to solve this whole problem, it is suggested that this report, together with the criticisms of it, be thoroughly perused.

Much difficulty frequently arises from the failure to recognize that there are two types of insanity, medical insanity and legal insanity. Medical insanity means simply that the individual is in such a disordered mental state as to require treatment in a hospital for mental diseases. Legal insanity means that the individ-

nal is in such a disordered mental state as not to be responsible for his acts. Medical insanity is a purely medical question. Legal insanity is more complicated, since it is not regarded as a purely medical question, but as a question of fact for the jury to decide. The criterion for establishing legal insanity in one country may be quite different from that in another country, and in the United States there is variation in the laws of various states, so that evidence which might cause a man to be declared legally insane in one state, would have the opposite effect in another state. A man in Indiana who commits murder because of "an irresistible insane impulse" would be declared insane. In New York he would be sent to the electric chair.

In the majority of trials, experts testify largely in relation to hypothetical questions. The prosecution endeavors to establish a series of facts by the testimony of various witnesses. It then builds up a hypothetical question, which assumes these facts to be established. The experts for the prosecution testify regarding the defendant's mental condition, on the assumption that these facts have been established. The defense endeavors to build up a different series of facts by the testimony of its witnesses. The experts for the defense then testify to the hypothetical question, which assumes that the defense has established all these facts. It is easy to see, therefore, why the opinions of experts so frequently disagree. They are answering entirely different questions. Perhaps they would agree if asked the same question. Why blame the experts, since the jury is held to be the only body capable of determining what the facts are?

But suppose the experts do testify from the result of their own examinations? Will they necessarily agree? Do experts in other lines agree when they all have the same data before them? The Supreme Court of the United States has frequently handed down five to four decisions, and yet all the members had the same data before them on which to pass judgment. Why expect any greater agreement among medical experts on problems which are not purely medical, but legal as well? In no other branch of medicine do we expect to find unanimous opinions regarding the diagnosis of a condition, as will be agreed by any attending physician of any large hospital.

So far as we have reason to respect the general character and scientific attainments of the psychiatrists employed we may properly refrain from criticism of them. If, on the other hand, there seems to be ground for suspecting incapacity or any degree of mental bias created by the employment of experts by one side or the other, competent men have a perfect right to express opinions. Publicity of the behavior of witnesses is, we believe, salutary. Under our system society demands a reasonable degree of information relating to crime and the treatment thereof. Punitive measures are not wholly actuated by revenge, but are to a large degree applied for

educational purposes. The logic of this form of treatment by society has often been assailed but it is the wish of the majority and hence stands as a part of the code.

If changes are desirable they should be brought about by an intelligent majority. Understanding of many of the common problems of society depends on publicity.

#### TREATMENTS OF INFECTIONS OF THE RESPIRATORY TRACT

THE *Monthly Bulletin* of the Boston Health Department for May, 1924, presents an article on the subject defined above.

After a brief discussion of the subject in which the arguments in favor of the treatment and the attitude of some patients and physicians are presented, reference is made to recent experiments of Lieutenant Colonel Edward B. Vedder, M. D., and Captain Harold P. Sawyer, M. D., of the U. S. Army Medical Corps and a conservative endorsement of the treatment is expressed. The statistics quoted tend to show that by the chlorine gas treatment 74.2 per cent of coryza cases were cured and 23.5 per cent improved. Acute laryngitis, whooping cough, influenza, acute and chronic bronchitis gave about the same results. Chronic laryngitis cases were all cured but chronic rhinitis was more rebellious.

These results were obtained in treating nine hundred and thirty-one cases. It may be recalled that President Coolidge submitted to this treatment recently. There is, according to the reports, very little benefit to be expected where efficient disinfection of deep seated structures or even tonsillar crypts is desired.

So far as we have been informed there has been no general adoption of this treatment. With results quoted it is desirable that more general use of the method should be tried, for it is incumbent on the profession to give to the public an authoritative statement of a claim which, if substantiated, would be of great importance.

Recent intimations of independent study by the Boston Health Department led to the hope that we would have further information. The expense of the necessary equipment and treatment is not great. Perhaps a subsequent bulletin will meet expectations.

#### SMALLPOX VERSUS VACCINATION

CERTAIN statements and figures have been and are being published that must cause the gravest concern to all intelligent readers. The *Journal of the American Medical Association* for July 26 under its Pennsylvania heading publishes a paragraph with the heading "General Warning of Smallpox." In this item the statement is made that up to July 19 there had been no abatement in the spread of smallpox in Pittsburgh, on that day five new cases having been reported before

noon, and the death list having increased to eleven. Apprehension over the growing number of smallpox cases throughout the country, moreover, has caused Surgeon General Cummings to notify state health officers to exercise the greatest vigilance in vaccination and re-vaccination.

In the same issue it is reported that Detroit's smallpox epidemic has ended, only ten cases having been reported for the week ending July 5, which is *below the normal for the last five years*. From January through June 1,508 cases with 140 deaths have been reported. Our alarm must come, not from the fact that Detroit's smallpox epidemic has ended, but that Detroit has had such an epidemic. Chicago seems to have sensed the growing alarm, having vaccinated 2,886 persons during June, which brings the total for the first six months of the year to 124,284.

The *New York Health News* for July 21 in reporting that, with the active coöperation of the citizens, nearly 1,000,000 vaccinations have been performed in Detroit, at least suggests the cause for the subsidence of the epidemic.

The *New York Times* of July 20 sheds further light on the seriousness of the situation in the statement that for the week ending June 21 thirty-five states had reported 895 cases as compared with 371 cases for the corresponding week a year ago, and for the same week 100 cities reported 345 cases as against 85 for the corresponding week in 1923.

Smallpox is one of the most highly contagious and one of the most terrible pestilences that has ever been known to visit the earth. Most of us now living are totally unfamiliar with the horror of uncontrolled epidemic smallpox. If the present attitude towards compulsory vaccination held by many of our citizens is allowed to grow we will not enjoy this ignorance for another generation. This is not a spectacular statement; it is a solemn warning.

The existence of unvaccinated men, women or children; the existence of cases of smallpox that have arisen within the borders of a civilized country are a blot upon its civilization. Those who would listen to fake prophets, let them beware. The anti-vaccinationists of England have sown the wind of this disordered logic, and England is reaping the whirlwind of pestilential death. America is following in line.

#### THE NEW YORK HEART ASSOCIATION

THIS Association was formed in 1915 and during the past five years has grown from a membership of 125 to 268. This year's budget amounted to \$17,260.20.

Four other cities, Boston, Philadelphia, Indianapolis and Chicago, have heart associations and six more groups are planning for similar societies. Heart clinics to the number of 140

have been started all over the country and a national organization has just been formed.

The New York Association distributed 40,000 pieces of literature during the year, 42 lectures were given and various exhibits have been shown.

The Associated Cardiac Clinics came into the Association this year as a committee of the Association, and has done much careful work, such as formulating uniform standards for clinics, holding meetings for all the social service workers in the cardiac clinics, etc.

At the beginning of 1924, with 32 New York hospitals coöperating, 48 clinics have been established, with a total of some 6,879 patients in attendance, a larger traffic than all the tuberculosis clinics of the Greater City have, even after 20 years of development of their organization and of widespread publicity. Already there is some definite lessening in the number of acute cases that have to spend long illnesses in the hospitals.

Definite plans for a larger membership in 1924 are under way. Newspaper and magazine publicity is growing fast. As a matter of fact and figures, the problem is like that of tuberculosis twenty years ago. The Association will not be satisfied until the public knows as much about heart disease as it now knows about tuberculosis.

### Therapeutic Column

#### THE USE OF ANTITOXIN IN DIPHTHERIA

BY EDWIN H. PLACE, M. D.

##### 1. Early administration.

The most important factor of antitoxin treatment of diphtheria is the time of administration. Each hour's delay in administering the antidote reduces its efficiency. If antitoxin is given during the first day of the disease, the death rate may be practically abolished. However, the onset of diphtheria is often so insidious and the general symptoms so slight that the first day often passes without the parents or the patient appreciating the possibility of this serious disease. Thus the physician does not have the opportunity of securing perfect results.

Moreover, when the physician is called the local evidence is not always easily interpreted and it is not possible to make a definite diagnosis. This should not prevent the effective use of antitoxin. The only safe rule for the physician is to give the antitoxin as soon as he is called to all cases of mucous membrane inflammation unless he can certainly exclude diphtheria. Exception to this rule may be made when it is clear that the inflammation is mild and harmless even if it were diphtheria. This means that many cases will receive antitoxin where it will later prove to



be unnecessary, but there is no practical harm in this, while serious results from delay in antitoxin treatment are bound to occur in some cases if the treatment is withheld until definite diagnosis can be made. It is not necessary therefore to prove the patient has diphtheria before antitoxin is given but it is essential to be sure the patient has not diphtheria if you are going to withhold antitoxin.

The physician must always keep in mind the seriousness of diphtheria infection of the larynx or below so that all cases showing croup symptoms should receive antitoxin unless diphtheria may be excluded. Cases of throat infection in which there is swelling of the throat or neck are always serious if due to diphtheria and here especially should antitoxin be given at once unless this disease can be excluded as the cause. The occasional infection with diphtheria of wounds and of the skin, eye and genitals should be remembered in dealing with inflammation of any of these regions.

## 2. Method of administration.

As antitoxin becomes effective only when brought into contact with the toxin, it must reach the blood stream before any benefit is secured. Therefore, administration directly into the vein is the most efficient method. If the antitoxin is given intramuscularly, especially into the glutei, with their rich crucial anastomosis, four times the intravenous dose should be given in order that the blood concentration may reach an effective degree within a short period (as a few hours).

Subcutaneous antitoxin is now considered undesirable for treatment as the effective dose would need to be about ten times the required intravenous amount. Of course, complete asepsis should be followed in all methods of administration.

## 3. Dosage.

The amount of antitoxin required varies with the toxin present, i. e., the severity of the case. There is no necessity of keeping the dose down to the minimum required for neutralization and, in fact, the exact amount of the antidote required cannot be determined. The dose, therefore, should be sufficiently large to be absolutely certain of neutralizing all the toxin which can be acted on in the body. Clinically, signs of subsiding of the diphtherial inflammation are considered evidence that more antitoxin is unnecessary. But it has now been proved by means of the Schick test after sufficient antitoxin has been given intravenously that subsidence of the inflammation may not occur for a period up to thirty-six hours and, in fact, the inflammation may rapidly increase during this period. An analogy to this might be drawn in burns where the inflammatory process may increase in the tissues for many hours after heat has been removed. It is thus evident that the clinician can-

not give antitoxin tentatively in small doses and continue it periodically until he sees clinical improvement. He must give a dose at once which his previous experience indicates is sufficient for the severity of that particular case and then await the results. Subsequent doses can be given at any time, of course, but should be given as soon as possible after the preceding dose as its necessity can be suspected and there must be a regret that the amount of the secondary dose had not been added at the time of the first treatment.

Great differences occur in opinions as to the effective dosage. In severe cases this may vary from ten thousand units to one hundred thousand units or even more. It can be said that too much cannot be given in practical work and that at times too little may be administered. Emphasis should again be put on the supreme importance of the earliness of treatment which by far exceeds the question of dose. The range of dosage at the South Department is shown in the table:

Mild cases	3,000- 5,000
Moderate cases	5,000- 30,000
Severe cases	30,000-100,000

For immunization, antitoxin should be given subcutaneously because of its slower absorption and elimination. Doses of from one thousand to two thousand units protect for from one to three weeks, or more.

## 4. By-effects.

Serum disease occurs much more frequently (more than twice) from antitoxic horse serum than from globulin solutions of antitoxin such as are now generally used. The frequency of such after-effects varies directly with the dose only in the smaller amounts. Urticaria, the most frequent after-effect, occurring in from 10-40%, appears characteristically about six days after administration. If sensitization is present it may appear in a few minutes or hours. The characteristic wheals make the diagnosis easy. It may last a few hours to five or six days rarely longer. The itching may be severe and there may be associated autonomic system disturbances as vomiting or fainting, but no serious harm occurs. Adrenalin solution, 1-1000, in five to fifteen minim doses subcutaneously or intravenously causes subsidence in most cases for a period of one to two hours. Local antipruritics and general sedatives may be used and the skin kept cool and free from local irritation.

Multiform erythema occurs at any interval up to three weeks but most commonly about ten days after administration. It may take many forms as morbilliform, scarlatiniform or rebelliform and cause difficulties in diagnosis. The most characteristic type is the circinate in which the macules fade in the center and spread to coalesce in bizarre patterns. These eruptions may

be accompanied by high fever due to the foreign protein acting on the heat control mechanism. The duration is usually three to four days. Marked hemorrhage into the skin lesions may occur and in some cases exfoliation may follow. No effective treatment has been found.

Angioneurotic oedema, especially of the face, hands and feet and occasionally general, occurs much less frequently. In no case, under my observation, has oedema of the mucous membrane, as the glottis, occurred. No treatment has been found effective; the oedema subsides usually in three or four days.

Arthralgia and myalgia occur less commonly, usually about the end of the first week. Pain occurs chiefly or only on movement. There is no local tenderness or other evidence of inflammation. Immobilization and salicylates reduce the pain. The duration is usually from two to three days, occasionally a week.

Arthus' phenomenon occurs with great rarity in routine treatment, but more frequently where serum is given repeatedly at intervals of two to three weeks. It is an evidence of previous sensitization. Marked local inflammation with redness, swelling, tenderness and heat appears in the tissues where the serum was given in the course of eight to twelve hours. Under poultices this subsides in a few days, usually one to two. It must be distinguished from infection which does not appear so soon nor so quickly reach the extent of Arthus' reaction. If the antitoxin is given intravenously no effects appear unless leakage occurs around the needle or from the vein.

Anaphylactic shock is the only serious after-effect and it occurs probably from one in ten thousand to one in fifty thousand cases in treatment of diphtheria. In a few minutes, after administration, there is uneasiness and a sense of oppression, usually with a rapid and often extreme urticaria and the rapid supervention of dyspnoea, cyanosis and death from asphyxia in the severer cases. In milder cases, these symptoms subside in a few minutes to an hour. The onset is so sudden, and the course so rapid that treatment is unsatisfactory. The most efficient treatment, probably, is adrenalin 1-1000 in ten to sixty minim doses intravenously or intracardially. Fortunately, it is probable that most of the cases liable to this rare reaction may be detected before administering antitoxin, by skin tests. There may be a history of other protein sensitizations, as asthma, vasomotor rhinitis, urticaria, food idiosyncrasies, etc., to warn one.

The intradermal test is made by injecting a small amount of serum 0.01-0.001 mil. intradermally. In sensitized cases a local area of oedema and redness should appear in from one to ten minutes.

Desensitization in all cases shown or believed to be sensitized to horse serum should be fol-

lowed. Subcutaneous injections at intervals at one-half hour are given as follows:

First injection	0.001 mil.
Second "	0.01 "
Third "	0.1 "
Fourth "	0.5 "
Fifth "	1. "

If no general reaction occurs the treatment dose may now be given intramuscularly safely in our experience. If during the desensitization, any dose should be followed by general symptoms, as slight dyspnoea, substernal oppression, a sense of anxiety, etc., these symptoms should subside before the next dose and a more gradual increase of dose be followed until no such reactions appear.

## CORRESPONDENCE

### A CIRCULAR LETTER RELATING TO CANCER

The Commonwealth of Massachusetts  
Department of Public Health  
State House, Boston

July 9, 1924.

To the Physicians of the State:

You are being sent a copy of the new booklet on cancer which is published by the American Society for the Control of Cancer. The latest authoritative information on the subject is here set forth in concise form. The expense incident to presenting these booklets to the physicians of the State is being met by the American Society for the Control of Cancer, the Massachusetts Committee of the American Society for the Control of Cancer, and the Massachusetts Department of Public Health. We hope that these booklets, like the free diagnosis service which has been offered by the State for some time, to all practicing physicians, will serve to emphasize the relationship which exists between the cancer problem and public health.

EUGENE R. KELLEY,  
Commissioner of Public Health.

### RECESS COMMITTEE APPOINTED TO CONSIDER AND REPORT ON MEDICAL MATTERS

The Commonwealth of Massachusetts  
House of Representatives  
Speaker's Room

July 8, 1924.

Editor, Boston Medical and Surgical Journal:

In Speaker Young's absence from this office, I beg further to answer your letter of June 25 relative to recess committee appointments on the committee to investigate the divisions of registration, the practice of midwifery and the registration of nurses and chiropractors. The Speaker appointed these members last Thursday and they are as follows:

Representatives William J. Bell of Somerville, Charles E. Abbott of Andover, Leverett Saltonstall of Newton, Henry A. Estabrook of Fitchburg, William H. Hannagan of Marlborough, Edward J. Kelley of Worcester.

The members appointed from the Senate by President Allen are Senators Eben S. Draper of Hopedale, Abbott B. Rice of Newton, and William J. Francis of Boston.

Very truly yours,  
EDNA C. BARRY, Secretary.

MISCELLANY

IMPORTANT MATTERS TO BE CONSIDERED BY A RECESS COMMITTEE OF THE MASSACHUSETTS LEGISLATURE

SEVERAL bills were heard by the Committee on Public Health last winter relating to the registration departments. The Committee did not feel called upon to recommend the passage or rejection of any of these bills and hence the creation of the Recess Committee.

This Committee under the Chairmanship of Senator Draper is acting under authority of the subjoined order:

SENATE—NO. 493

THE COMMONWEALTH OF MASSACHUSETTS

In the Year One Thousand Nine Hundred and Twenty-Four

Order relative to an Investigation of the Various Methods of Registration in the Commonwealth.

*Ordered*, That a joint special committee, to consist of three members of the senate and six members of the house of representatives, to be designated by the president of the senate and the speaker of the house, respectively, shall sit during the recess of the general court for the purpose of investigating every aspect of the organization, practice and procedure of the various divisions of registration in the department of civil service and registration, with particular reference to the methods of examining and registering applicants for examination or registration, the advisability or necessity of increasing or lowering the prescribed requirements for the registration of such applicants, and the enforcement of the laws governing said registration by duly appointed inspectors of said department. The committee shall also consider the subject matter of current House bill No. 223 relative to the practice of midwifery and the registration of midwives; of current House bill No. 293 relative to the registration of nurses and nursing attendants, and of current House bills 746 and 1071, relative to the registration of persons practicing chiropractic. The committee shall have quarters in the state house, may hold hearings, may require the attendance and testimony of witnesses and the production of books and papers relating to any matter under investigation, and may administer oaths to witnesses testifying before it. It may employ such assistance as may be necessary and may expand, from such amount as the general court may appropriate, such sums, not exceeding five thousand dollars, as may be approved by the governor and council. Said committee shall report the results of its investigation, together with such recommendations and drafts of legislation as it may deem advis-

ble to the next general court, not later than the fifteenth of December, nineteen hundred and twenty-four.

The next meeting of the Committee is scheduled for August 13. Every District Society should send one or more delegates to these hearings. These delegates should keep in touch with Dr. T. J. O'Brien, 501 Beacon St., Boston, Secretary of the Legislative Committee, and arrange for getting notices of subsequent hearings.

The matters to be considered by the Committee are of great importance.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

DISEASES REPORTED WEEK ENDING JULY 26, 1924

Disease	No. of Cases	Disease	No. of Cases
Anterior poliomyelitis	4	Ophthalmia neonatorum	10
Chickenpox	42	Pellagra	1
Diphtheria	70	Pneumonia, lobar	17
Dogbite	4	Scarlet fever	71
Dysentery	1	Septic sore throat	1
Encephalitis lethargica	3	Syphilis	40
Epidemic cerebrospinal meningitis	1	Tetanus	1
German measles	10	Suppurative conjunctivitis	13
Gonorrhea	126	Trachoma	2
Influenza	1	Tuberculosis, pulmonary	107
Malaria	1	Tuberculosis, other forms	19
Measles	137	Typhoid fever	13
Mumps	51	Whooping cough	67

MAINE STATE DEPARTMENT OF HEALTH

REPORT OF COMMUNICABLE DISEASES REPORTED FOR THE WEEK ENDING JULY 19, 1924

Chickenpox		Measles	
Boothbay	1	Bangor	2
Lewiston	1	Georgetown	1
Presque Isle	3	Kittery	1
Waterville	1	Lewiston	2
York	2	Limerick	2
Diphtheria		Old Orchard	1
Appleton	1	Sweden	7
Argyle	1	Topsham	2
Gardiner	1	Woodstock	1
Lewiston	1	Meningitis, Cerebrospinal	
Portland	2	Waterboro	1
Waterville	2	Mumps	
German Measles		Leeds	4
Jonesport	1	Madison	2
Milo	1	Norridgewock	1
Norridgewock	1	Old Orchard	1
Portland	1	Readfield	2
Gonorrhea		South West Harbor	1
Bangor	1	Pneumonia	
Calais	1	Eustis	2
Lewiston	1	Lewiston	1
Madison	1	Magalloway Pl.	1
Millinocket	1	Milo	2
Oakland	2		
Portland	1		
Sanford	1		

<i>Scarlet Fever</i>		Grand Isle	2
Bath	1	New Gloucester	1
Ellsworth	2	Portland	1
Grand Isle	1		—
Jonesport	1		11
Lewiston	5		
Millinocket	1	<i>Tubercular Meningitis</i>	
Newburg	1	Bangor	1
South West Harbor	1		
Waterville	2	<i>Tuberculosis</i>	
	15	Portland	2
		New Gloucester	1
		North New Portland	1
		Verona	2
<i>Smallpox</i>			—
Patten	1		6
<i>Tetanus</i>			
Harmony	1	<i>Whooping Cough</i>	
Portland	1	Bath	1
	2	Cornville	1
		Grand Isle	1
		Portland	5
<i>Typhoid Fever</i>			8
Auburn	2		
Bath	1		
Boothbay Harbor	3	Venernal diseases	9
Gardiner	1	Other diseases	101

## CONNECTICUT DEPARTMENT OF HEALTH

WEEKLY MORBIDITY REPORT FOR THE WEEK ENDING  
JULY 19, 1924(Including all cases reported before 11 A. M., Monday,  
July 21, 1924)

<i>Diphtheria</i>		Hartford County	
Fairfield County		Hartford	1
Bridgeport	9	State total	3
Danbury (C)	1	Last week	7
Shelton	2		
<i>Hartford County</i>			
Bristol	1	<i>Scarlet Fever</i>	
Enfield	1	Fairfield County	
Hartford	7	Bridgeport	2
Manchester	1	Danbury (C)	1
Rocky Hill	1	Darien	1
Wethersfield	1	Hartford County	
Windsor	2	Bristol	2
Windsor Locks	1	Hartford	2
Litchfield County		Manchester	1
Salisbury	1	New Britain	1
<i>New Haven County</i>		Litchfield County	
Ansonia	2	Sharon	1
Waterbury	2	New Haven County	
West Haven	1	Meriden (C)	1
New London County		New Haven	4
New London	1	Waterbury	1
Norwich (C)	1	West Haven	2
Stonington	1	New London County	
Tolland County		Colchester	1
Somers	1	Windham County	
Stafford	1	Putnam (C)	1
	—		—
State total	38	State total	21
Last week	36	Last week	43

The following diphtheria  
bacilli carriers were  
reported:

Hartford	2	Darien	2
New Haven	3	Greenwich	10
Waterbury	1	New Canaan	1

*Typhoid Fever*

Fairfield County		Hartford County	
Danbury (C)	1	Hartford	4
Norwalk	1	Manchester	2
		New Britain	2

Litchfield County		New London County	
Watertown	8	Colchester	1
Middlesex County		Groton (B)	1
East Haddam	1	Tolland County	
New Haven County		Stafford Springs	1
Beacon Falls	7	Windham County	
Branford (B)	2	Plainfield	1
Meriden (C)	5	Pomfret	1
New Haven	8		—
New London County		State total	43
New London	2	Last week	71
Norwich (C)	1		

State total	61	<i>Smallpox</i>	
Last week	35	Windham County	
		Danielson	3

<i>Measles</i>		State total	3
Fairfield County		Last week	6
New Canaan	1		

<i>Other Communicable Diseases</i>			
Hartford County			
East Hartford	10		
Hartford	4	Cerebrospinal men.	2
Manchester	1	Chickenpox	17
Windsor	1	Encephalitis epid.	2

Litchfield County		German measles	4
North Canaan	1	Influenza	1
Salisbury	2	Mumps	9
Sharon	1	Pneumonia (lobar)	5

Middlesex County		Poliomyelitis	3
East Haddam	1	Tuberculosis (pul.)	30
New Haven County		" (other forms)	5
Milford	4	Gonorrhea	32
New Haven	9	Syphilis	22
West Haven	2		

## INSPECTION OF SUMMER CAMPS

To assist the proprietors in maintaining camps which conform to these health essentials, the Connecticut State Department of Health has added to its staff for the summer months two men who will inspect all the camps in the State—vacational, automobile, wayside tourists, boarding houses, shore resorts and vacation homes. Inspections of these camps will be made in detail, paying particular attention to the water supply and sewage disposal, making analyses of the water, supervising the bathing facilities and the condition of the water at the principal bathing resorts.

## CONNECTICUT DEPARTMENT OF HEALTH

WEEKLY MORBIDITY REPORT FOR THE WEEK ENDING  
JULY 26, 1924(Including all cases reported before 11 A. M., Monday,  
July 28, 1924)

<i>Diphtheria</i>		State total	—
Fairfield County		Last week	28
Bridgeport	10		38
Fairfield	2	The following diphtheria	
Shelton	2	bacilli carriers were	
Trumbull	1	reported:	
Wilton	1	East Lyme	1
Hartford County		Hartford	4
Farmington	1	New Haven	2
Middlesex County			
Haddam	1	<i>Malta Fever</i>	
New Haven County		New Haven County	
Derby	1	New Haven	1
New Haven	1		
Waterbury	3	State total	1
West Haven	2	Last week	0
New London County			
Griswold	1	<i>Scarlet Fever</i>	
Lebanon	1	Fairfield County	
New London	1	Bridgeport	2



Danbury (C)	2	East Hartford	3
Ridgefield	1	Hartford	7
Hartford County		Litchfield County	
Bristol	1	Sharon	1
Hartford	3	New Haven County	
New Britain	2	New Haven	14
Plainville	1	Windham County	
Wethersfield	2	Pomfret	2
Litchfield County		State total	30
Thomaston	1	Last week	43
Middlesex County			
Cromwell	1	Whooping Cough	
New Haven County		Fairfield County	
Hamden	1	Bridgeport	5
Meriden (C)	1	Darien	2
New Haven	1	Fairfield	9
Oxford	2	Greenwich	14
West Haven		Westport	2
New London County		Hartford County	
New London	1	Glastonbury	3
State total	23	Hartford	5
Last week	21	Litchfield County	
		Norfolk	1
Typhoid Fever		Salisbury	1
Fairfield County		Watertown	5
Bridgeport	1	Middlesex County	
Danbury (C)	2	East Haddam	2
Greenwich	1	New Haven County	
Stamford (C)	2	Beacon Falls	1
Hartford County		Hamden	1
Enfield	1	Meriden (C)	3
Litchfield County		New Haven	7
Plymouth	1	New London County	
Middlesex County		New London	2
Portland	1	Tolland County	
New Haven County		Somers	2
Meriden (C)	1	State total	65
State total	10	Last week	61
Last week	3		
Smallpox		Other Communicable Diseases	
Windham County		Cerebrospinal men.	1
Danielson	1	Chickenpox	13
Plainfield	1	German measles	3
State total		Malaria	5
Last week	3	Mumps	14
		Pneumonia (lobar)	9
Measles		Poliomyelitis	4
Fairfield County		Septic sore throat	1
Bridgeport	1	Tetanus	1
Fairfield	1	Tuberculosis (pul.)	37
Stamford (T)	1	" (other forms)	4
Hartford County		Gonorrhoea	12
		Syphilis	25

# RHODE ISLAND STATE BOARD OF HEALTH

## CONTAGIOUS DISEASES REPORTED TO THE STATE BOARD OF HEALTH OF RHODE ISLAND FOR THE WEEK ENDING JULY 12, 1924

Diphtheria	Providence	1
Newport	Warren	3
Pawtucket		
Providence	Mumps	
	Pawtucket	1
Scarlet Fever	Providence	1
East Greenwich	Warren	1
Pawtucket	Westerly	1
Providence		
Westerly	Chickenpox	
	Warren	1
Measles	Whooping Cough	
Pawtucket	Providence	2

## CONTAGIOUS DISEASES REPORTED TO THE STATE BOARD OF HEALTH OF RHODE ISLAND FOR THE WEEK ENDING JULY 19, 1924

Diphtheria	Providence	1
East Providence	(Para-Typhoid Fever)	
Newport		
Providence	Measles	
South Kingstown	Providence	2
Scarlet Fever	Chickenpox	
Pawtucket	Providence	1
Providence	Westerly	1
Scituate		
Westerly	Mumps	
	Westerly	1
Typhoid Fever	German Measles	
Providence	Little Compton	2

## THE INTER-STATE POST GRADUATE ASSEMBLY OFFERS POST-GRADUATE INSTRUCTION

THIS organization, directed by the Tri-State District Medical Association, extends a hearty invitation to the physicians of America who are in good standing in their State or Provincial Societies to attend the annual assembly, which is to be held at Milwaukee, Wisconsin, October 27th, 28th, 29th, 30th and 31st, five full days of post graduate work.

Among the eminent members of the profession and citizens who have accepted places on the program are the following:

Dr. Nicholas Murray Butler, President of Columbia University, New York, N. Y.  
 Sir Arthur William Currie, President of McGill University, Faculty of Medicine, Montreal, Canada.  
 Merritte W. Ireland, Surgeon-General of the United States Army, Washington, D. C.  
 Monsieur J. Jusserand, French Ambassador to the United States, Washington, D. C.  
 Edward E. Stitt, Surgeon-General of the United States Navy, Washington, D. C.  
 Professor Theodore Tuffler, Professor of Surgery, Faculty of Medicine, Paris, France.  
 Dr. John V. Barrow, Los Angeles, Calif.  
 Dr. W. F. Braasch, Mayo Clinic, Rochester, Minn.  
 Dr. George E. Brewer, Emeritus Professor of Surgery, Columbia University, College of Physicians and Surgeons, New York, N. Y.  
 Dr. Alan Brown, Professor of Pediatrics, University of Toronto, Faculty of Medicine, Toronto, Canada.  
 Dr. Ralph C. Brown, Assistant Professor of Medicine, Rush Medical College, Chicago, Ill.  
 Dr. C. Macfie Campbell, Professor of Psychiatry, Harvard University, School of Medicine, Cambridge, Mass.  
 Dr. Walter T. Connell, Professor of Medicine, Queen's University, Faculty of Medicine, Kingston, Canada.  
 Dr. John F. Cowan, Professor of Surgery, Stanford University, School of Medicine, San Francisco, Calif.  
 Dr. George W. Crile, Professor of Surgery, Western Reserve University, School of Medicine, Cleveland, Ohio.  
 Dr. Samuel J. Crowe, Clinical Professor of Laryngology, Johns Hopkins University, School of Medicine, Baltimore, Md.  
 Dr. LeRoy Crummer, Professor of Medicine, University of Nebraska, College of Medicine, Omaha, Neb.  
 Dr. Walter E. Dandy, Associate Professor of Sur-

gery, Johns Hopkins University, School of Medicine, Baltimore, Md.

Dr. William Darrach, Dean and Associate Professor of Surgery, Columbia University, College of Physicians and Surgeons, New York, N. Y.

Dr. Vernon C. David, Assistant Professor of Surgery, Rush Medical College, Chicago, Ill.

Dr. David J. Davis, Professor of Pathology and Bacteriology, University of Illinois, School of Medicine, Chicago, Ill.

Dr. John B. Deaver, Professor of Surgery, University of Pennsylvania, School of Medicine, Philadelphia, Pa.

Dr. Laurence R. DeBuis, Professor of Pediatrics, Tulane University, School of Medicine, New Orleans, La.

Dr. George F. Dick, Assistant Professor of Medicine, Rush Medical College, Chicago, Ill.

Dr. Charles A. Elliott, Professor of Medicine, Northwestern University, School of Medicine, Chicago, Ill.

Dr. Leonard W. Ely, Professor of Surgery, Stanford University, School of Medicine, San Francisco, Calif.

Dr. Joseph Evans, Professor of Medicine, University of Wisconsin, School of Medicine, Madison, Wis.

Dr. A. MacKenzie Forbes, Clinical Professor of Orthopedics, McGill University, Faculty of Medicine, Montreal, Canada.

Dr. William Goldie, Associate Professor of Medicine, University of Toronto, Faculty of Medicine, Toronto, Canada.

Dr. Marvin L. Graves, Professor of Medicine, University of Texas, School of Medicine, Galveston, Texas.

Sir Henry Gray, Royal Victoria Hospital, Montreal, Canada.

Dr. Don M. Griswold, Professor and Head of Department of Preventive Medicine and Hygiene, State University of Iowa, Iowa City, Ia.

Dr. Garfield M. Hackler, Professor of Surgery, Baylor University, School of Medicine, Dallas, Tex.

Dr. John A. Hartwell, Associate Professor of Surgery and Clinical Surgery, Cornell University, Medical College, New York, N. Y.

Dr. Carl A. Hedblom, Professor of Surgery, University of Wisconsin, School of Medicine, Madison, Wis.

Dr. William B. Hendry, Professor of Obstetrics and Gynecology, University of Toronto, Faculty of Medicine, Toronto, Canada.

Dr. Russell D. Herrold, McCormick Institute for Infectious Diseases, Chicago, Ill.

Dr. Julius H. Hess, Professor of Pediatrics, University of Illinois, School of Medicine, Chicago, Ill.

Dr. Russell A. Hibbs, Professor of Orthopedic Surgery, Columbia University, College of Physicians and Surgeons, New York, N. Y.

Dr. Frederick J. Kaiter, Associate Professor of Medicine, Jefferson Medical College, Philadelphia, Pa.

Dr. Allen B. Kanavel, Professor of Surgery, Northwestern University, School of Medicine, Chicago, Ill.

Dr. Ralph A. Kinsella, Associate Professor of Medicine, University of St. Louis, School of Medicine, St. Louis, Mo.

Dr. Francis H. Lahey, Professor of Clinical Surgery, Harvard University, School of Medicine, Boston, Mass.

Dr. Dean Lewis, Professor of Surgery, Rush Medical College, Chicago, Ill.

Dr. LeRoy Long, Dean and Professor of Surgery, University of Oklahoma, School of Medicine, Oklahoma City, Okla.

Dr. William E. Lower, Professor of Urology, Western Reserve University, School of Medicine, Cleveland, Ohio.

Dr. Charles B. Lyman, Professor of Clinical Surgery, University of Colorado, School of Medicine, Denver, Colo.

Dr. N. J. MacLean, Associate Professor of Surgery,

University of Manitoba, Faculty of Medicine, Winnipeg, Canada.

Dr. Ralph H. Major, Professor and Head of Department of Medicine, University of Kansas, School of Medicine, Rosedale, Kan.

Dr. Charles H. Mayo, Mayo Clinic, Rochester, Minn.

Dr. William J. Mayo, Mayo Clinic, Rochester, Minn.

Dr. Edward Miloslavich, Director of Department of Pathology and Bacteriology, Marquette University, School of Medicine, Milwaukee, Wis.

Dr. Roger S. Morris, Professor of Medicine, University of Cincinnati, School of Medicine, Cincinnati, Ohio.

Dr. Bernard H. Nichols, Department of Roentgenology, Cleveland Clinic, Cleveland, Ohio.

Dr. Walter L. Niles, Dean and Professor of Clinical Medicine, Cornell University, School of Medicine, New York, N. Y.

Dr. William F. Petersen, Associate Professor of Pathology and Bacteriology, University of Illinois, School of Medicine, Chicago, Ill.

Dr. Dallas B. Phenister, Assistant Professor of Surgery, Rush Medical College, Chicago, Ill.

Dr. Harry M. Richter, Professor of Surgery, Northwestern University, School of Medicine, Chicago, Ill.

Dr. Stanley P. Reimann, Director of Laboratories, Lankenau Hospital, Philadelphia, Pa.

Dr. David Riesman, Professor of Clinical Medicine, University of Pennsylvania, School of Medicine, Philadelphia, Pa.

Dr. Milton J. Rosenau, Professor of Preventive Medicine and Hygiene, Harvard University, School of Medicine, Boston, Mass.

Dr. E. C. Rosenow, Mayo Clinic, Rochester, Minn.

Dr. G. W. Stevens, Milwaukee, Wis.

Dr. Wallace Irving Terry, Professor of Surgery, University of California, School of Medicine, San Francisco, Calif.

Dr. John H. J. Upham, Professor and Head of Department of Medicine, University of Ohio, School of Medicine, Columbus, Ohio.

Dr. George Gray Ward, Jr., Professor of Obstetrics and Gynecology, Cornell University, School of Medicine, New York, N. Y.

Dr. Louis M. Warfield, Professor of Internal Medicine, University of Michigan, School of Medicine, Ann Arbor, Mich.

Dr. George Weaver, McCormick Institute for Infectious Diseases, Chicago, Ill.

Dr. Charles J. White, Professor of Dermatology, Harvard University, School of Medicine, Boston, Mass.

Dr. Charles S. Williamson, Professor of Medicine, University of Illinois, School of Medicine, Chicago, Ill.

Dr. Milton C. Winternitz, Dean of Yale University, School of Medicine, Professor of Pathology and Bacteriology, New Haven, Conn.

Dr. John A. Witherspoon, Professor of Medicine, Vanderbilt University, Medical Department, Nashville, Tenn.

Dr. John L. Yates, Milwaukee, Wis.

Dr. Hugh H. Young, Clinical Professor of Urology, Johns Hopkins University, Medical Department, Baltimore, Md.

Dr. Abraham Zingher, Assistant Professor of Hygiene, University and Bellevue Hospital, Medical College, New York, N. Y.

#### INVITATION TO AMERICAN PHYSICIANS

This association is supervising an Inter-State Post-Graduate Clinic Tour to Canada, British Isles and France, to start May 18, 1935. Leading teachers and clinicians of Canada and Europe will arrange and conduct clinics and demonstrations in the following clinic cities:

Toronto and Montreal, Canada; London, Liverpool, Leeds, Manchester and Newcastle, England; Edin-

burgh and Glasgow, Scotland; Dublin and Belfast, Ireland; Paris, Lyon and Strasburg, France.

Besides the main tour special tours to practically all the leading centers of Europe will be arranged. Sightseeing trips to all places of interest in the countries visited will be included in the regular tour.

Cost of tour, including first-class hotels, board, steamship, clinic arrangements and all ordinary traveling expenses, under \$1000.00.

The tour is open to physicians in good standing in their State societies, their families and friends who are not physicians.

For information, write the Managing Director, William B. Peck, Freeport, Ill.

### A PROBLEM AS CONSTRUED IN VIRGINIA

#### THE NEW VIRGINIA LAW TO PRESERVE RACIAL INTEGRITY

SENATE BILL 219 to preserve racial integrity passed the House March 8, 1924, and is now a law of this State.

This bill aims at correcting a condition which only the more thoughtful people of Virginia know the existence of.

It is estimated that there are in the State from 10,000 to 20,000, possibly more, near white people, who are known to possess an intermixture of colored blood, in some cases to a slight extent it is true, but still enough to prevent them from being white.

In the past it has been possible for these people to declare themselves as white or even to have the Court so declare them. Then they have demanded the admittance of their children into the white schools, and in not a few cases have intermarried with white people.

In many counties they exist as distinct colonies holding themselves aloof from negroes, but not being admitted by the white people as of their race.

In any large gathering or school of colored people, especially in the cities, many will be observed who are scarcely distinguishable as colored.

These persons however are not white in reality, nor by the new definition of this law, that a white person is one with no trace of the blood of another race, except that a person with one-sixteenth of the American Indian, if there is no other race mixture, may be classed as white.

Their children are likely to revert to the distinctly negro type even when all apparent evidence of mixture has disappeared.

The new law further provides for the registration of all persons who desire it, and who will make application for such registration of color and birth, remitting at the same time the fee of twenty-five cents for each applicant. These births will be permanently recorded and preserved for all time, and will be of great value for many purposes, such as to prove American citizenship when applying for passports to go abroad, and for establishing and preserving the family tree for future generations.

### SIR WILLIAM OSLER MEMORIAL VOLUME

A VOLUME of about three hundred pages bound in hard covers, illustrated with photographs, and half-tone prints, is being prepared by Dr. Maude E. Abbott under the auspices of the International Association of Medical Museums, a society in which Osler always took a very great interest. The book will contain some fifty original articles of his Canadian, Philadelphia, Baltimore, and Oxford periods which are reminiscent of different phases of his activities written from personal knowledge by intimate friends. It will be completed by a Classified Bibliography of his various publications and by a list of "Writings about Osler." The edition is limited to one thousand copies. The subscription list is still open and subscribers of \$10.00 or upwards will have their names published in the subscribers' list at the front of the volume and will receive a copy of the book. I shall be glad to forward subscriptions to Dr. Abbott.

HENRY R. VIETS, M. D.

Hotel Canterbury,  
Boston, Mass.

### CAMBRIDGE ANTITUBERCULOSIS ASSOCIATION

THE Cambridge Anti-Tuberculosis Association has recently issued its twentieth annual report. The activities of the association are many, including the preventorium care of children in the six beds maintained by the association at Sharon, summer day camps providing for nearly five hundred children, a health center, educational work and a visiting service at the Tuberculosis Hospital. The annual Christmas Seal Sale netted the association over \$7000.

### ANTI-VACCINATION ACTIVITIES

It has been reported that Mr. Nunn, representing the Medical Liberty League, Inc., is at work trying to create a sentiment among the people of this state against compulsory vaccination. The particular purpose is to influence representatives in the legislature and thereby to lay a foundation for legislation next winter which will remove the present vaccination laws from the statutes.

### THE BERKSHIRE DISTRICT

The summer meeting of the Berkshire District Medical Society was held July 31 at the Hotel Aspinwall, Lenox.

With Dr. John B. Deaver of Philadelphia and Dr. Frank H. Lahey of Boston to discuss the scientific features of diseases of the upper right quadrant of the abdomen, Chauncey Depew to relate some of his personal experiences with doctors and others, an excellent dinner in a well-conducted hotel, a spirit of hospitality

characteristic of the officers of the society—all combined to make this an extremely interesting meeting.

Dr. Deaver and Dr. Lahey have promised to have their addresses published in this journal.

The usual attendance of the Berkshire District meetings rarely exceeds fifty, but, augmented by visiting physicians from other districts, the number exceeded one hundred on this occasion.

A message from President Bigelow was conveyed by the Editor of the JOURNAL, relating to the hearings to be conducted by the recess committee of the Legislature on the bills before the Committee on Public Health last winter, but which have been referred to the recess committee.

It was explained that the Legislative Committee of the Massachusetts Medical Society earnestly desires the coöperation of the District Societies.

The important bills relate to the attempt to secure State recognition of chiropractic, larger latitude in selecting members of the Board of Registration in Medicine by the Governor, and the midwife bill.

The first hearing by the recess committee will be held August 13.

### ATTLEBORO HEALTH CAMP

THE Attleboro Health Camp opened for its summer season on July 7. This camp, accommodating thirty undernourished boys, is conducted by the Attleboro Tuberculosis Society and the Attleboro Health Department, and is financed by the Attleboro Lions Club. Children between the ages of 8 and 14 are admitted for a 6 weeks' stay on condition that a physical examination has been performed by the Health Department, and teeth and tonsil defects corrected. No tuberculosis contacts are admitted. The camp personnel consists of two directors, Dr. William P. Hewitt and Mrs. Walter M. Kendall, with a paid supervisor of recreation, an assistant, a nurse and a cook.

### NEW ENGLAND SURGICAL SOCIETY

At the Boston meeting Dr. Greenough, in discussing Dr. Channing Simmons' paper on "Delays in the Surgical Treatment of Cancer," spoke of the difficulty in securing data in many hospitals, and further said that:

"The Executive Committee of the Massachusetts General Hospital requires of every house officer taking a cancer history that he shall fill in what we call the 'cancer data.' We would

Abstract Record Sheet Carcinoma of Breast		Surgeon	City	Age	S or M.
Clinic					
Name or Initials of Patient			Address	Hospital No.	
Name of Family Physician			Address	Date of Entrance	
FAMILY HISTORY OF CANCER				Date of Operation	
PAST HISTORY	Children	Ages	Lactation History		
	Miscellaneous		Wassermann		
	Trauma		Previous Disease of Breast		
PRESENT HISTORY	ENTRANCE EXAMINATION		RESULT		
Symptoms of Onset: Date	Location and extent of disease		Date	YEARS	
Nature	Breast R + L Size of tumor		a. Operative fatality	2	5
Date first consultation with physician	Adhesion of skin		b. Alive and well		
Advice received	Adhesion to chest wall		c. Untraced and inconclusive		
Treatment before entrance	Retraction of nipple		d. Alive with recurrence		
	Ulceration		e. Died with recurrence		
	Skin nodules		f. Died without recurrence		
Duration of Tumor at entrance	Other breast		Recurrence		
Symptoms at entrance	Axillary nodes R L		Date		
Tumor	Apex axilla R L		Where?		
Change of size with Cts.	Supraclavicular nodes R L		Local (in field of op.)		
Pain	Mediastinum		Regional (adjacent nodes)		
Discharge from nipple	Skeleton		Remote		
Eczema	Lung		Time since onset		
Other symptoms	Liver		Time since treatment		
Complications	Other				
Treatment: (1) Amputation—Breast, both Pectorals, Axillary contents; (2) Tumor only; (3) Breast only; (4) Breast and Axilla only; (5) Breast and Muscle only					
(6) Supraclavicular Operation; (7) Preoperative X-Ray; (8) Preoperative Radium; (9) Postoperative X-Ray; (10) Postoperative Radium.					
Operator	Was exploratory incision made?		Date		
Pathologist	Date	Gross	Postoperative Complications		
Breast	Axillary nodes		Microscopic		
Medullary	Scirrhous	Adeno-carcinoma	Recurrence		
			Celloid		



These blanks were arranged by the Committee on Cancer of the American College of Surgeons, of which Dr. Greenough is Chairman, and are three in number,—Breast, Mouth and Cervix. (A sample of the Breast sheet is enclosed; the others are similar in character.) They are printed by J. L. Fairbanks & Co., 63 Federal

WALTER G. PHIPPEN, *Recorder.*

## EYE SIGHT CONSERVATION

Accident prevention, in the automobile con-

cern mentioned, is also part of the campaign of the Safety Department. Goggles are supplied to workers with jobs affording any likelihood of eye injury, and the number of eye accidents has been greatly reduced in this way.

It has been found, moreover, that proper lighting is an essential factor in eye conservation. The result of this prevention system has been increased production, "due to many incidental factors such as fewer accidents, less waste and spoilage of material, improved quality of workmanship and greater individual comfort and efficiency."

#### APPOINTMENT OF DR. JOHN M. BIRNIE

DR. GEORGE H. JAMES of Westfield has resigned from the Board of Registration in Medicine and the vacancy has been filled by the appointment of Dr. John M. Birnie of Springfield.

Dr. Birnie is a graduate of Williams College and the Harvard Medical School. His post-graduate work was in the Massachusetts General Hospital, The Children's Hospital of Boston and the Boston Lying-In Hospital.

He has developed a large surgical practice in Springfield and is held in high esteem by the profession. He brings to this important position a well-trained mind and a judicial temperament.

The Governor has made a good selection for this important position.

#### APPLICATION FOR A MANDAMUS DENIED

ISADORE FOX, a graduate of the St. Louis College of Physicians and Surgeons, applied to the Massachusetts Supreme Court for a mandamus which would, if issued, require the Board of Registration in Medicine to accept his application for examination.

The Board had previously declined to accept any applications from this institution because of evidence tending to show non-compliance with the legal requirements for recognition.

The St. Louis College has been under investigation in connection with irregularities in Connecticut.

The Supreme Court declined to issue the mandamus.

#### STATE OF CONNECTICUT HEALTH BULLETIN

THE State of Connecticut *Health Bulletin* for May, 1924, issued by the State Department of Health contains a report on rabies in Connecticut; a brief outline of the reasons for reporting the ages of communicable disease patients; a short and interesting article on the laboratory and tuberculosis; laboratory reports; and articles on the mental hygiene clinic and drainage of swamps on watershed. The *Bulletin* is brief and readable and should prove of interest to the citizens of the State.

#### LABORATORIES MOVING TO HARTFORD

WITHIN two weeks the Bureau of Laboratories of the State Department of Health of Connecticut will move to Hartford. Since 1918 the laboratories have occupied the Botany Building of the Connecticut Agricultural Station on Huntington Street, New Haven, to which place it moved from Middletown in 1917.

The Bureau of Laboratories will be on the second and third floors of a building on the corner of Pearl and South Ann Street, Hartford, No. 247 Pearl Street.

Notice will be sent to all physicians and health officers when the exact date of moving is decided upon.

#### ANNOUNCEMENT

DR. ESTER M. G. SUNDELOF, of Roxbury, was married to the Rev. Eric G. Ericson, vicar of St. Bartholomew's Episcopal Chapel in East 127th St., New York, at the Chapel of the Cathedral of St. John The Divine, in New York, on July 21, 1924.

#### APPOINTMENTS

APPOINTMENT OF DR. FLORENCE R. SABIN.—Dr. Florence R. Sabin, Professor of Histology, Johns Hopkins Medical School, has been appointed a Member on the Scientific Staff of the Rockefeller Institute for Medical Research. She enters on her new position September 1, 1925.

DR. AURA MILLER, for the past three years assistant hospital pathologist at the Iowa State University Hospital, has recently received an appointment from Harvard University. Dr. Miller will take up his work with Dr. Wolback, July 1.—*Iowa State Journal*.

#### REMOVALS

DR. HARRY SCHWARTZMAN, of Dorchester, has an office at 276 Commonwealth Ave., Boston.

DR. NICHOLAS W. COUSENS of Waltham now has a Boston office at 220 Marlborough St.

DR. THOMAS W. WICKHAM has changed his office from 483 Beacon St. to 395 Commonwealth Ave.

DR. CHARLES H. WINN's Boston office is now 31 Milk St.

DR. LOUIS E. WOLFSON has a residence in Malden and an office at 520 Beacon St., Boston.

DR. RALPH R. YOUNG has moved from Roxbury to Jamaica Plain, where his office is at 480 Centre St.

DR. DAVID D. GREENE has removed from 27 Bay State Road to 402 Marlborough St.

DR. JOELLE C. HIEBERT now has an office at 36 Hull St., Boston.

DR. SETH L. STRONG has moved from Marshfield Hills (Plymouth) to 390 Riverway, Roxbury (Norfolk).

DR. BERNARD F. GILCHRIST, of Springfield, has changed his office address from 647½ to 719 Main St.

DR. MOSES G. KOTLER has removed from Malden (Middlesex South) to Dorchester (Norfolk). His office is at 28 Leverett St., Boston.

DR. ABRAHAM S. THOUPIN now has his residence in Brookline and his office at 353 Commonwealth Ave., Boston.

DR. FREDERICK W. O'BRIEN has a residence as well as an office at 465 Beacon St., Boston.

DR. B. W. CAREY is now at the Child Hygiene Demonstration, Athens, Ga.

DR. MORRIS B. SANDERS' address is now 321 Dartmouth St., Boston.

DR. FLORENCE E. H. KNOWLTON has returned to the Belmont Hospital, Worcester, from Sparta, Wisconsin.

DR. JAMES J. REGAN, of South Boston, now has an office at 419 Boylston St., Boston.

DR. LOUIS B. HAYDEN has removed from Haverhill (Essex North) to Plymouth (Plymouth) where he has an office at 79 Court St.

DR. SAMUEL A. ROBINS, of Roxbury, now has an office at 536 Commonwealth Ave., Boston.

DR. HARRY L. ROTHBLATT has moved his residence to Dorchester (Norfolk) and his office to 41 McLean St., Boston.

DR. BENJAMIN W. RUDMAN has moved his residence to Roxbury (Norfolk). His office is at 68 Bay State Road, Boston.

DR. OSCAR J. RAEDER now has his residence in Brookline and his office at 39 Bay State Road, Boston.

DR. ARTHUR I. SHAIN has moved his residence from Roxbury (Norfolk) to Boston. His office is at 130 Salem St.

DR. ALBERT A. SHAPIRA now has a residence in Jamaica Plain (Norfolk) and an office at 21 Bay State Road, Boston.

DR. JAMES F. BOWEN is now at U. S. Veterans' Bureau, 95 Central Ave., Albany, N. Y.

DR. EDWARD D. HURLEY has removed from South Boston (Suffolk) to Belmont (Middlesex South). His office is at 419 Boylston St., Boston, as before.

#### RECENT DEATH

DR. FREDERICK STOCKER RADDIN, of Chelsea, a Fellow of the Massachusetts Medical Society from 1892 to 1921, died at his home in that city after an illness of several months, July 28, 1924, at the age of sixty.

Dr. Raddin was born in Lynn Aug. 19, 1865, and went to Chelsea at an early age. He was a resident of Chelsea for 45 years and a practicing physician there for 30 years. He attended the public schools and was graduated from the Boston Latin school, took an A. B. at King's College, Nova Scotia, in 1888 and an M. D. at Harvard Medical School in 1891. He then went to London and took a three-year course at a lying-in hospital. He was a member of the surgical staff of the Frost Hospital, now known as the Chelsea Memorial Hospital. He is survived by his widow and one son, Reginald S. Raddin.

#### NOTICES

#### CLINICAL CONGRESS OF THE AMERICAN COLLEGE OF SURGEONS

FOURTEENTH ANNUAL SESSION, NEW YORK,  
OCTOBER 20-24, 1924

The surgeons of New York and Brooklyn have planned a highly attractive program of clinics and demonstrations for the Fourteenth Annual Clinical Congress to be held in New York and Brooklyn October 20th to 24th, 1924. A representative committee of New York surgeons, with Dr. Eugene H. Pool as Chairman, and Brooklyn surgeons, with Dr. John E. Jennings as Chairman, are arranging a clinical program that will completely represent the clinical activities in that great medical center, to include all departments of surgery, and we may confidently assume that this year's session will surpass in scientific interest all previous efforts.

In a general way the plans for this year's meeting conform to those of recent sessions. Clinical demonstrations in the hospitals will occupy the morning and afternoon hours of each of the four days, Tuesday to Friday, inclusive. The first formal session will be the Presidential Meeting on Monday evening, and the Congress will close with the Eleventh Convocation of the College on Friday evening. The annual Hospital Standardization conference will be held on Monday and Tuesday, both morning and afternoon.

The Executive Committee of the Congress is preparing programs for scientific meetings on Tuesday, Wednesday and Thursday evenings, including two special sessions for those interested in the surgical aspects of ophthalmology, otology, rhinology and laryngology. The list of speakers includes eminent European, American and Canadian Surgeons.

Headquarters will be at the Waldorf-Astoria.

#### UNITED STATES CIVIL SERVICE EXAMINATION

THE United States Civil Service Commission announces the following open competitive examination:

##### JUNIOR MEDICAL OFFICER

(*Tuberculosis; Neuropsychiatry*)

Applications for the above positions will be accepted until August 19. Vacancies are at the U. S. Veterans' Hospital, Tuskegee, Ala. The Tuskegee hospital has been built for colored patients. It will be the policy to select colored eligibles for appointment. The entrance salary is \$2,840 a year.

Applicants must show that they have been graduated from a medical school of recognized standing or be senior students in such institution and furnish, within six months from the date of the examination, a statement from the proper official of the medical school attended attesting actual graduation. In addition, applicants must meet the requirements contained in one of the following groups: Special training in tuberculosis or in neuropsychiatry for a period of at least three months, either before or after graduation from medical college; service for a period of not less than three months in a hospital devoted to the treatment of tuberculosis or of mental disease; or any equivalent combination of the special training and experience prescribed in one of the two preceding classes.

Competitors will be rated upon their education, training, and experience.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil-service examiners at the post office or customhouse in any city.

#### UNITED STATES CIVIL SERVICE EXAMINATION

The United States Civil Service Commission announces the following open competitive examination:

##### PHYSIOTHERAPY AIDE PHYSIOTHERAPY PUPIL AIDE

The examinations will be held throughout the country on August 6 and September 17. They

are to fill vacancies in the Public Health Service and in the Veterans' Bureau throughout the United States.

The entrance salaries for physiotherapy aide in the Public Health Service range from \$960 to \$1,200 a year; physiotherapy pupil aides are not required in this service. In addition to these salaries, appointees will be allowed quarters, subsistence, and laundry.

The entrance salaries for physiotherapy aide in the Veterans' Bureau range from \$1,600 to \$2,500 a year; the salaries for physiotherapy pupil aide in this service range from \$1,000 to \$1,400 a year.

The duties of physiotherapy aides consist of administering physiotherapy in its several branches—massage, electrotherapy, hydrotherapy, mechanotherapy, thermotherapy; active, passive, resistive, and assistive exercises and remedial gymnastics; keeping daily record of the work and progress of each and every patient coming under direction and treatment; making the required reports of the activities of the reconstruction work in physiotherapy.

The duties of physiotherapy pupil aides are the same as those for physiotherapy aides, except that they are pupils under the supervision and instruction of the chief aide in all the work above mentioned.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of the U. S. civil-service examiners at the post office or customhouse in any city.

#### UNITED STATES CIVIL SERVICE EXAMINATION

THE United States Civil Service Commission announces the following open competitive examination:

##### BACTERIOLOGIST (MEDICAL)

Receipt of applications will close August 12. The examination is to fill a vacancy in the Hygienic Laboratory, Public Health Service, at an entrance salary of \$3,000 a year.

Applicants must have been graduated from a college of recognized standing, with major work in bacteriology; and, in addition, must have had at least three years of graduate work or experience in medical or public health bacteriology of a research nature.

The duties of the position are to perform independently or with associates or through subordinates work of major importance in bacteriology.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil-service examiners at the post office or customhouse in any city.